This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

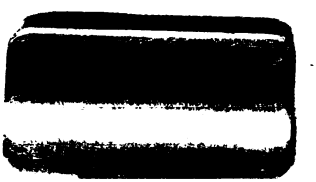
Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

$B 33 913

CALIFORNIA POULTRY PRACTICE

WRITTEN TO TEACH BETTER POULTRY METHODS ON THE FARM. BY SUSAN SWAYSGOOD

BERKELEY
LIBRARY
IVERSITY OF
ALIFORNIA



MRS. SUSAN SWAYSGOOD

California Poultry Practice

BEING

Plain Hints for Beginners in the Rearing, Housing, Feeding, Protecting from Pests and Diseases and Marketing of Poultry Products

---

BY

SUSAN SWAYSGOOD

Special Contributor on Poultry Topics of the Pacific Rural Press

---

PACIFIC RURAL PRESS
SAN FRANCISCO
1915

[2]

PRESERVATION
COPY ADDED
ORIGINAL TO BE
RETAINED

1/00

LOAN STACK

COPYRIGHT, 1914
BY
PACIFIC RURAL PRESS

GIFT

SF487
S88

PREFACE

This book is not an accident; it is born of a desire to help others to avoid the stumbling blocks in the poultry business and at the request of many readers of The Pacific Rural Press, and other papers.

With forty-five years of experience with poultry it is to be expected that I have learned a few things about it; it's a poor business that does not teach lessons in that length of time. Don't you think so?

There are books, yes, books without number, on poultry matters, but many of them are mostly theory. This book tells you just what I have done and how I would do it.

It is a book of action, and it is action that counts these days. We have to act in the living present if we want to live. I want to live and I want others to live, too, and as I have learned these things by experience it is fitting that I should tell others how to obtain results without paying such a big price for the experience.

The things told you in this book are original, unorthodox, but strictly practical; and if you will read and then heed, you will be well satisfied that the author has given you your money's worth. California is an Empire in itself, and I am sure there are enough men and women engaged in the poultry business, or wanting to get into it to call for a million copies of this book, though its only claim is that it is needed.

Yours for better and more poultry,

SUSAN SWAYSGOOD.

[4]

LIST OF ILLUSTRATIONS

Mrs. Susan Swaysgood.
Partial Open Front Poultry House.
Open Front House with Wire Netting.
Double Poultry House.
Poultry in Orchard and Colony Houses.
Glimpse of Petaluma Poultry Section.
A Stockton Poultry Yard.
Typical California Leghorn Ranch.
Poultry Ranch and Colony Houses.
A Breeding Pen of Pekin Ducks.
Merced County Band of Turkeys.

CONTENTS

Chapter.

I Some of the Advantages of California Poultry Raising.
II When and How to Start in the Poultry Business.
III Location.
IV The Colony Plan.
V Open Front Houses.
VI Large and Small Plants for Eggs.
VII The Care and Management of Eggs.
VIII How to Build an Incubator Cellar.
IX How to Run the Incubator.
X Raising the Chicks.
XI Why Chicks Die in the Shell.
XII A Few Don'ts in Raising Chicks.
XIII Brooders and Brooding Systems.
XIV The Building of Brooder Houses.
XV Poultry Appliances.
XVI Raising Broilers.
XVII Feeding for Eggs.
XVIII Balanced Rations, What Are They?
XIX Feeding the Breeders.
XX Fattening and Preparing Fowls for Market.
XXI Balanced Ration for Heavy Breeds.
XXII The Mold that Injures Poultry.
XXIII Egg Foods, or Condition Powders.
XXIV The Value of Milk in the Poultry Yard.
XXV The Management of Poultry During the Summer.
XXVI The Molt in California.
XXVII The General Purpose Fowl.
XXVIII Capons.
XXIX Prepotency and Prolificacy.
XXX The Mediterranean Class.
XXXI The American Class.
XXXII The French Breeds.
XXXIII The Asiatic Class.

XXXIV The English Class.
XXXV Games and Orientals.
XXXVI Duck Culture in California.
XXXVII Turkeys in California.
XXXVIII Raising Geese Profitable.
XXXIX Pigeons for Profit and Pleasure.
XL Poultry Diseases and Their Remedies.
XLI Parasites Affecting Poultry and Methods of Extermination.
XLII Secrets of the Show Birds' Toilet.
XLIII Killing Poultry.
XLIV What Los Angeles Poultrymen Have Accomplished by Co-operation.
XLV Preserving Eggs.

California Poultry Practice

CHAPTER I

SOME OF THE ADVANTAGES OF CALIFORNIA IN POULTRY RAISING

Climate.—First of all, the advantage is our unsurpassed climate, where chickens can forage outdoors every day in the year without any inconvenience whatever. Here we can raise the best specimens of all breeds outdoors. Breeds that require a long season to make their growth have no trouble to make it without being put in houses at all, except as chicks.

The very cheapest of poultry houses can be used with comfort to both hens and attendant. A good roof constitutes the making of a good poultry house, as the rest is a small item.

Good Markets.—Very few places, except the vicinities of New York City or Boston, have such good markets for all poultry products as we have in all parts of the State. Good railroad facilities carry the product to the cities. A growing country can always be depended on for good markets; the Pacific Coast, at least the California part of it, has just commenced to have growing pains, and these will continue for many years yet. All the cities are growing faster than all the rest of the United States and there is a reason for it. Men are getting tired of buffeting blizzards in winter and falling down with heat prostration in summer. They are looking towards California for a haven they can call home.

Continuous Green Feed.—In the eastern poultry papers we read of experiments with silos for storing poultry feed for winter, and cellars for oat sprouters. All these things cost money and labor and without doubt they are all necessary adjuncts of an eastern poultry plant, but not in this State. All the year around we can go out in the garden and get our green succulent feed for the hens; all the year around the hens can be turned out on the alfalfa to pick their own green feed. Only those who have lived in a cold climate can appreciate what this means to a poultryman, both as regards the cost of feed for the winter months and the amount of labor necessary to provide something of a succulent nature for the winter months.

In California Grains Sprout Without Artificial Heat.—The oat sprouter that must be bought, or made, to sprout oats in the cellar is advertised in all poultry journals, and varies in prices from a few dollars to fifty. Then the cellar room must be provided and room to store the oats. Then, too, there is a lamp to fill and trim, oil to buy, and last but not least, is the danger from the lamp. Besides this there is the labor, from all of which we are relieved by our mild climate.

Health.—But aside from all these things the greatest advantage we have over other States is the healthfulness of the occupation. Even delicate women who have never been able to do outdoor work of any kind, will, after being in California a short time, undertake to do the work of a poultry ranch here. This is certainly one advantage we are proud of and justly so, because poultry raising is essentially a woman's business. Some of the largest poultry ranches in the State are owned and run by women who do practically all their own work.

No Danger of Overdoing.—There are no indications at present that the poultry business will ever be overdone in this State. The people are flocking in and as neighborhoods get more thickly settled more stringent sanitary laws will be imposed on those who keep poultry inside city limits, and this will force out large numbers who are too indifferent and careless to obey the law, and the poultry and egg supply will have to be produced in the small country places.

CHAPTER II

WHEN AND HOW TO START IN THE POULTRY BUSINESS

This is, perhaps, the one question that is asked more frequently than any other; and it is perhaps the hardest to answer. It is hard to answer because the person asked does not have an inside knowledge of the inquirer's financial status, nor his natural assets of grit, sticktoitiveness and adaptability.

If a man is well fixed financially he can afford to experiment, otherwise he wants to know what he is doing before he experiments. And to start in any business without a fair understanding of the principles is to court failure. The time has passed when any old failure can take up the poultry business and make any kind of success without understanding something about it. But in a general way it is possible to advise as to when and how to start to best advantage.

In the fall of the year, if a house and yard is ready, is really the best time to start with hens. If finances are low so that hens cannot be purchased, then wait until spring and buy either baby chicks or eggs for setting. Very often a second-hand incubator can be bought for the price of a few hens, in which case the start can be made with a very small sum of ready cash.

If the start is made with hens it is well to know just what variety or breed you want to raise, then get some good poultry or agricultural paper and study its columns for advertisers that have the breeds you want. Buy good stock if possible, as half a dozen good hens will give more satisfaction than double the number of poor ones.

During the winter months there is time to study the habits and good qualities of the little flock and to prepare to venture farther, if things are satisfactory. If they are not, and the beginner finds that poultry does not have the attraction for him he had been led to believe it would, he can drop out with no great loss of either time or money. On the other hand if the beginner finds he is suited, he can during the winter months prepare to enlarge his flock and take care of it.

The one great mistake that most people make is to try to raise more chicks than they have room for. Some even try to raise more than they can feed, and both of these are serious mistakes, for they usually end in disaster. Growing chicks need lots of room and an abundance of good wholesome food if they are to give good results for the care. So whatever else you do—do not go deeper than you can see the way clear, for to go beyond your depth is to get discouraged and lose your grip.

A man that starts small and works his way slowly will know how he got there, in other words, he will know what to avoid and what to do for the best results at little expense.

The poultry business is like all other kinds of business in that it must be conducted economically if there is to be any profit. The profit escapes in little leaks that are not noticed unless a person is watching for them. There are just lots of people that have started in with a few hens and by diligence and perseverance worked up quite a large poultry plant, at the same time making a comfortable living for themselves and family and even having a bank account, something they never had before.

And what one man has done another can do if he possesses the qualities that will help him to hold on, and while waiting for his chickens to grow, makes every effort to help them. Such a man or woman need not hesitate to venture into the poultry business, for success awaits every one who has grit and hustle.

CHAPTER III

LOCATION

Every business is a bigger success when it is in the right location. In the poultry business location means several things in one. For instance, it must include nearness to market for the product, nearness to food supplies, to water; then the quality of land must be considered. As to the land, a rather light friable soil is the best for poultry, because it has plenty of drainage for water. All fowls do better on well drained land than on wet, swampy land, where they must wade through water during the rainy seasons.

If the beginner must buy a place it is much better to take these things into consideration before than after. As for sunshine, there are very few places in California where there is not an abundance of it and to spare.

But right here let me say that the most ideal poultry ranch is one that is combined with a prune or plum orchard. There is no other fruit that responds so well to poultry droppings; besides the hens keep the trees free from many insect pests and furnish ideal conditions for the full maturing of the fruit, while the hens in turn are benefited by the shade and insect life found in the ground or on the trees.

A five acre prune orchard and two thousand chickens will support in comfort and give many of the luxuries of life for the average family of today. True, the green feed would have to be grown outside of the five acres, but a good sized oat sprouter would supply that and it could be placed in an old hen house.

This would be rather intensive poultry raising and would require good sanitation, but all the care given in that respect would pay both in prunes and poultry, so that it would work both ways.

Location very properly includes nearness to market, and constant knowledge of what the market demands. And these things are among the most vital if you are going to depend on poultry for a living. Getting your product to market at as low a cost as possible, and your feed the same, makes all the difference between profits and loss. The wise man looks up the market situation first, then chooses his location.

CHAPTER IV

THE COLONY PLAN

This is really the most economical way of running a poultry plant and orchard combined. To save yourself worry and loss it will be cheaper to fence the land at the start. Redwood posts cost a trifle more at first but save later on because they last a long time. Put a five-foot wire fence of two-inch mesh and a couple of strands of barb wire on top and you have a fence that will keep out all animal marauders, and chicken thieves will fight shy of it. All houses for the colony system should be built on runners, so that they may be hauled around by horse power. In summer they can be taken to the farthermost points of the land, and when fall comes haul them closer in for the winter. This need not be such a big haul, either, because if the houses are placed in line in the first place, and moved every few days just their own length, they are on new, clean ground all the time, saving the labor of cleaning out and gradually coming into winter quarters. As the houses are moved, the cultivator can be run over the ground, mixing the droppings with mother earth so that the land is getting its full share of the elements for nourishment in the best possible form, for by being mixed with the dry earth at once there is very little loss in the droppings.

The Houses.—All houses intended for colony plant should be built on runners, as before stated, and if both ends are shaped like sled runners the houses can be moved either way without twisting and turning, as is the case when only one end of the runners are shaped sled fashion. This appears a simple thing, but it saves most of the wear on houses. The houses should not be of very heavy material, and yet heavy enough to stand a storm without danger of blowing over. The ideal colony house should hold fifty or sixty Leghorns or Minorcas, and from thirty-five to forty of any of the large breeds.

It should be open front and built of material suitable to its location. In the northern part of this State we used to build the walls of sawed shakes, lapped over like shingles; the roof was also of shakes, but laid on a little differently. These made light, portable houses, that were rain proof, wind proof and when painted or whitewashed, very respectable looking. But shakes are now as high as lumber, and paper appears to be in more demand for light houses. A Riverside poultryman, who keeps several thousand hens, has nothing but these light houses covered with roofing paper. The cost of his houses he says,

"is about $6 each, and some of them have been in use over two years with very little signs of being worse for wear." Some of my pullets are being raised in small houses having a paper roof, but burlap tacked on ends and back. This material allows air to pass through freely and acts as roosting house for nights and shade in the day time. And I am going to winter some in the same kind of houses, and some in canvas houses. In the southern part of California we do not have rain enough to call for expensive poultry houses, yet we do need a good roof at all times.

In localities where the rainfall is heavier, lumber gives better satisfaction. Matched lumber costs a little more in the first place, but as it requires no battens and is wind as well as water proof, it is really cheaper in the long run.

But whatever the material used it is the roof that is the most important part of the building, for with a leaky roof, no matter how good the walls may be, the chickens are not very comfortable.

Shingle roofs should have a one-third pitch, while paper roofs can be made more flat; however, the more pitch a roof has the longer it will last, for the rain does not stay on to rot the material.

CHAPTER V

OPEN FRONT HOUSES

The open front house has passed the experimental stage from the Atlantic to the Pacific Coast. In the Eastern and Middle States there must necessarily be many modifications owing to climatic conditions, but here in California there is no occasion to modify at all; just three covered sides and ends and the straight open front in all cases is the healthiest and best. The houses can be so arranged as to evade the most direct winds; thus if northern winds are prevalent in a locality, let the houses face some other direction, and so on. Everybody can plan for local advantages or disadvantages in that respect, but stick to the open front straight without compromise. The material for the ends and back may be just what answers the best all round purposes according to financial or other conditions. A good roof, that is a roof that will keep the poultry dry, and that the owner can keep in a condition free from vermin pests, is a necessity in any climate. Such a roof need not be costly in our climate, and the one that will be described answers every purpose for California, and can be made to answer even for the coldest place by putting a ceiling independent of the roof, where it freezes hard.

Mite Proof Roof.—The rafters may be of any strength desired. We use one by three set on edge, but two by two would be just as good, perhaps better, but this item can be just what suits each one. Having

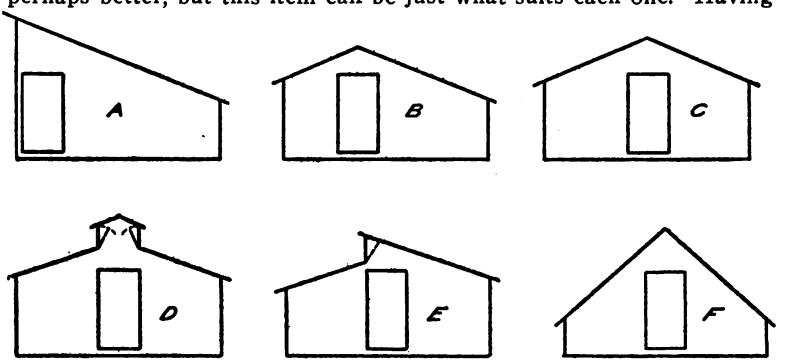


FIG. 5.—Types of roofs for poultry houses. *A*, shed; *B*, combination; *C*, gable; *D*, monitor; *E*, semi-monitor; *F*, A-shaped.

the rafters on, unroll wire netting of one or two-inch mesh. Of course the smaller mesh is the stronger and will hold up better if the building is large. Space the rafters to the width of the wire netting if possible, so as to keep the wire straight and smooth. Fasten down a portion at a time, while a helper keeps the wire stretched. If rafters are too far apart it will be well to use a batten or some light stay between. Now fasten down with double pointed carpet tacks well driven home. If the roof has a ridge pole it is better to commence tacking the wire on the lower edge and unroll across ridge pole, making fast at ridge, then down to outer edge of the other side. When the roof is wired and well fastened down (use plenty of tacks) the roofing paper should be laid the same way as the wire and fastened down with the usual cement and nails. If mites or ticks should ever venture in this roof they can be reached with a spray pump and killed with two sprayings at most; where in case of a shingle, board or shake roof you must burn the roof to rid it entirely of the vermin.

In a cold climate, an air space can be made by duplicating this roof on the inside, or by putting in a ceiling. The latter would be the easier if not cheaper and would answer all purposes. In case of a flat or shanty roof, the wire may be spread as on the ridge roof and the paper makes a better appearance if run crosswise instead of lengthwise.

An Open Front House for Fifty Hens.—This house is 6 x 10; the sills are of 2 x 4, the front studs are five feet, 2 x 3, and are three in number; the back is four feet high and studs are 2 x 3, also end studs are same material. The front is made in two separate panels, meeting at the center studding and are held in place by buttons. This makes it very convenient for cleaning, spraying or any other use you may have for going in and out handy, as one or both panels can be taken out in a minute. The floor can be either of earth or board, as desired. Dropping boards are eighteen inches from the floor and a row of nests fits right up to the dropping boards. The nests are open at the back, being reached from the outsde by a hole cut in one end; the front of the nests is a board hinged at the bottom and held in place by two hooks or buttons. The eggs are gathered from the front by the operator, who is under cover if raining. As there is ample space for fifty Leghorn or any of the small breeds, the floor may have litter on it and the hens be fed a grain breakfast right in the building, though it is not large enough to be called a scratching house as well as a laying and roosting house for all the time. Still it will answer for that if hens are given liberty after breakfast. The reason it is just six feet is that that width is easier to move without straining. A twelve or fourteen-inch board the whole length of the front serves as an awning for rainy or very sunshiny weather. This can be movable so as to lay back on top of building when not wanted, or during cleaning-out operations.

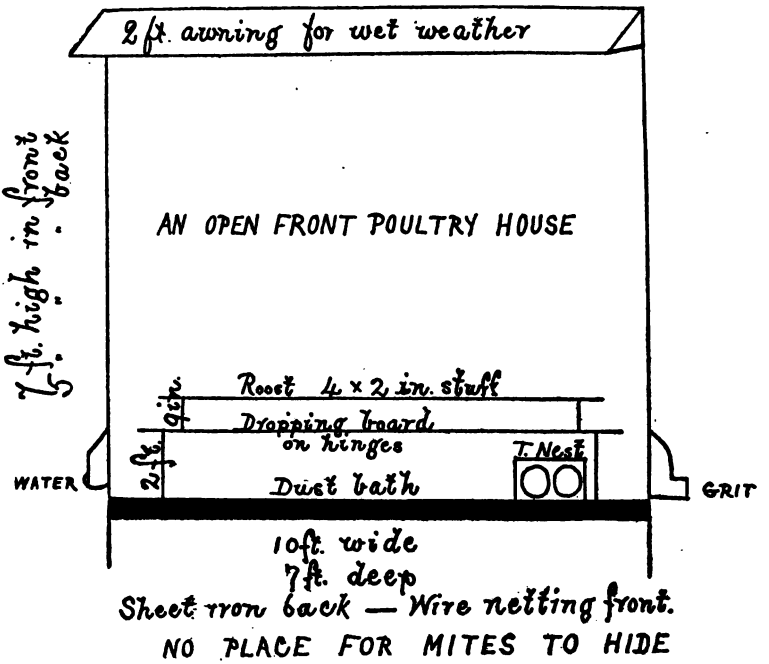


Diagram of an open-front California poultry house. May be of any desired length.

The roof is of wire and roofing paper, as described before, and this house can be made very presentable by boarding up the ends and back with matched lumber such as is used in bungalows, etc. By putting the dropping boards and perches at one end, all the way across with nests underneath, the other end can be used as a scratching pen in bad weather, and with a moderate sized yard would be ample room for fifty chickens.

A Larger Open Front House.—This house is made of heavier material and is intended to stay in one place. The house is 10 feet wide, 7 feet deep and may be any length to suit. Front is made in panels as in the other with dropping boards on hinges or stationary. It is 7 feet high in front and has a drop of two feet, owing to extra width. Roosts in all cases should be 2 x 2 Oregon pine. These are mite resisters and last a long time. The roof is of paper and wire, but has heavier rafters, 2 x 4 being plenty light enough. The back and ends

may be of sheet iron, common lumber or matched lumber to suit the pocket and wish of the builder.

The Double Open Front House and Scratching Shed Combined.— For those who are building permanently this is by far the best arranged house I have seen. This one has a shingle roof, but that is optional. Mr. Suits, the owner and builder of this house, thinks one expense is the best, so he shingles and paints his roofs so that they will last indefinitely. It costs, though, and if mites got in, they would not be as easily reached as in a wire roof.

CHAPTER VI

LARGE AND SMALL PLANTS FOR EGGS

This branch of the poultry business is generally conducted along special lines. That is **eggs** are the main object in view. Very often the proprietor does not keep any breeders, but buys his chicks from a hatcher, who, in turn, makes a specialty of hatching; and the hatcher buys his eggs from a man who makes a specialty of keeping hens as breeders. These eggs are contracted for at certain prices above the market quotations. The hatcher, before contracting, goes to see the stock and bargains for the method of feeding, so as to insure himself and patrons good stock. If the hens do not appeal to the hatcher he will not contract, but will seek other breeders, as he does the very best he possibly can to safeguard himself and those who trust their orders to him. But we all know that "the best laid plans of mice and men gang aft aglee," and so sometimes a hatcher does not get what he bargains for.

The egg farm that is to make good and run at a profit all the year round, must know not only what kind of eggs are put in the incubator to hatch, but must **know** how the hatching is done. The best success comes from keeping your own breeders, feeding them as outlined in another chapter, and knowing the history of the parents.

The commercial hens for an egg farm are first the Leghorns, and it matters little what color, so that you get a strain of healthy birds that will lay a good sized white egg. In localities where hawks are troublesome the dark chick will be left and the white one taken every time, and this counts in the end.

Second to the Leghorns come the Minorcas, and here I make the statement without fear of contradiction, that the Black Minorca is the best egg laying machine in the whole list.

Breeders say, "they eat more than Leghorns." I agree with that. If they did not eat more than Leghorns they could not lay the number of eggs they do, and Minorca eggs are of the largest size. I don't say they are the largest, but they belong among layers of the largest white eggs. If I were just running an egg farm, Black Minorcas would be first choice.

The large white egg brings top prices and if a special trade is worked up for private families, or among soda fountain men, the Minorca eggs bring more than any other.

The Parcel Post, is one method of selling eggs to private families that the modern poultryman has at his command. Just a few lines in a city paper will bring the enquiries, and the charges are so light in the first zone that it will be profitable to both contracting parties.

If you hatch your own chicks it is necessary to hatch them so that when the pullets molt their last feathers and commence to lay, they will stay on the job and not lay off about two or three months in the best paying part of the season.

The first chicks should be hatched to come out in the middle of February; the second lot should be on hand with the new moon in March; the third lot with the April new moon. Always catch the moon from the new to within five days of being full. Where there is plenty of shade chicks can be hatched up to June; then the male should be removed from the breeding pens and the hens given their liberty. After the molt, start up the breeding yards again and get one good hatch of chicks out in October. These chicks will help out the following summer when the other hens commence to lag, as they will molt a little earlier than the others but will not take so long. As they are young, they can even be put through a forced molt and have them back in sixty days.

The eggs must be kept coming in and this can only be done by having chicks follow each other in rotation. March chicks are always considered best but that is not an absolute fact, though they are good, but we can't have all in one month, nor is it advisable to do so.

Leghorns can be matured in from five to six months and they will then lay a fair sized egg and keep laying; but if matured before that age they are not reliable layers, but more in the nature of freaks. I have seen them lay at four months of age but no satisfaction is obtained by such early maturity.

Minorcas are a little longer coming through, and I think that is one reason that they are not more popular on egg ranches. Minorcas must be fed a good, substantial ration right from the start and if they lay at seven months they are all right. From then on you will collect the big white egg that will bring in the best prices and the Minorca hen in her second year is a better layer than during the first year. This is a good offset to the late maturity. To get the best out of Minorcas they should be hatched in February, March and April, not later, and kept growing from the start. By keeping them through the molt and feeding well, they can be gotten back to work in sixty days and the second season's eggs will be larger and the hens will lay more of them than the first year.

With Leghorns it is advisable to cull out all the weakest, smallest hens every year and replace with chicks; to do this one must hatch double the quantity needed as one half will be cockerels. With Minorcas, if the flock is not to be increased, it is not necessary to

hatch every year unless from a desire to have some ready to take the place of others at molting time.

The Anconas are claiming great attention just now as layers of large white eggs. Some authorities go so far as to prophesy they will run the Leghorns off this Coast as layers.

The hatching season must be governed by the quantity of eggs needed, and strict tab kept on all expenditures and income so that you may know where you stand financially at any time.

A California General Purpose Poultry Ranch—There are more general purpose ranches in California than just special egg farms, and the small fruit ranch where natural shade abounds is of all places the best for a general purpose poultry ranch. Fruit, poultry and bees are just right for those who can handle bees. The poultry breeds best adapted to the general purpose farm are the American and English classes. The birds of both these classes are good layers of colored eggs. These eggs do not count as firsts in some markets, but as there is but about one cent difference they more than make up in price by numbers during the winter months when eggs are highest.

The chicks should be hatched in rotation as on the egg farm, because by so doing you have broilers to sell nearly all the time, and that brings in an income that should help out the feed bill. The broilers command the highest price and if you keep them for fryers and roasters they bring more. But it requires room and shade. When the hens are to be disposed of, namely, when they have outlived their usefulness as layers, they will still bring what it cost to raise them and a profit or wages for the labor. For instance, a crate of Orpington hens, twenty-five in number, was shipped to a commission man at Los Angeles. The quotations were, small hens 13 cents; large hens 18 cents. The twenty-five hens brought $27.57, and this was a poor price, though all expense was paid and this was net.

Now let us see what twenty-five small hens would bring and average them at four pounds each, something they don't do unless fed on corn. The twenty-five would bring, if they weighed four pounds each, just $13.00, a few cents over half what the heavier or the general purpose fowl brought. Did it take that much more to raise the large hen?

That is a question that should be asked more frequently. I claim it does not take any more to raise an Orpington than a Leghorn and not near so much as it does to raise a Minorca. To the casual observer this will not be seen, at least they want "to be shown." The fact is it only requires common sense, and any one can see. The Leghorn chick is a restless, wiry piece of living activity; the chicks of the larger breeds are contented; they can eat and rest, using up the food consumed to build up bone and muscle. The small breed chick

is always on the move, ever looking up some new place to get into mischief and the very food it eats is run through it like a sausage machine, always grinding but never holding what it grinds.

Intensive Poultry Farming

It is a notable feature in this method of poultry keeping that the intensive farms are all along one line, namely, eggs. The farmer or poultryman who keeps the general purpose fowls keeps them in ordinary runs or ranges, not cooped up in little dinky houses, nor even in large roomy houses. However, there is little doubt but that intensive poultry farming can be conducted in our dry climate to much better advantage than in a cold or very wet climate.

In 1913 we gave an account of a poultry plant on a city lot that occupied a space of 25x100 feet. The plant consists of one house 20x100, is two stories high and has pens 20x20 feet, holding 100 hens. There is a cellar, which serves as a manure pit. There is an office and feed room on the first floor, and a room the size of one pen for storing litter, etc. The building has a gable roof and on the south side is nearly all open. The product is all sold at the office at retail, customers calling for the eggs, which command a premium of five cents a dozen over those sold at the grocery store. No chicks are raised, but instead 400 pullets are bought each year to keep up the stock. The flock is kept two years, so that half of them are always hens and the other half pullets.

When the hens stop laying in the fall they are sold to the egg customers at 20 cents per pound, and the proprietor claims that nearly all of them are disposed of at this rate. By this method the old hens can come very near paying for the pullets.

The proprietor says, having conceived the idea that hens could be made to pay in houses on the "no yard plan" it did not seem very far away to put them in a two story building and do away with all land and yards. Hence, as there was no use in buying land and locating in the country in order to have an egg farm, he decided to have his egg factory right in the city. Strict cleanliness is the watchword, the dropping boards are cleaned every day. A little car runs on a trolley just beneath the dropping boards and the manure is scraped directly into it. It runs to the end of the building and empties into a chute, where it falls into the manure pit in the cellar. The same car is used when the pens are cleaned out to carry both clean and dirty litter. No foul smells or odors are allowed to remain in any part of the plant. A systematic method of spraying is used that keeps everything sweet and clean.

The Method of Feeding.—The hens are fed a dry mash from a hopper that stands on a platform above the floor. Scratch grain is

thrown in the litter twice a day to give the hens exercise. There is city water and all the founts on one floor are filled by turning on a faucet. These founts are also on a platform so that no litter can be scratched into them. Sprouted oats are fed for greens, and here the basement or cellar is utilized, as the oats are sprouted there.

The advantages of a plant of this kind are, first; the fowls are all under one roof, as are also the necessary belongings to take care of them. The operator has the hens under full control; if one is sick he can easily catch it. His cleaning can all be done in an orderly fashion and need not take up very much of his time. Being no yards, there is no danger of soil contamination. Plenty of litter in the pens keeps the birds in exercise and at the same time it keeps the floors clean and dry. But the biggest advantage lies in the fact that the business can be conducted without middlemen or extra expense, such as horses and wagons for delivery, which would also mean drivers.

As no chicks are raised there would be no need for crowing cocks, thus all eggs would be free from germ life and such eggs keep better in warm weather, and are really better for table use at all seasons, so that such a plant need not be a nuisance in any city. It would have to be tried, however, before any one could tell whether California housewives would be willing to do their part toward saving middle men's profits.

CHAPTER VII

THE CARE AND MANAGEMENT OF EGGS

Market eggs should be gathered and cared for as faithfully as if for hatching. Cases with good clean fillers should be ready to receive the eggs as soon as gathered, and the cases should be stored in a room where the temperature can be kept at about 50 or 60 degrees. There should be no strong smell from vegetables, oils or other matter because eggs, like cream, absorb odors through the shell. The egg fillers particularly, should be above reproach, for if there is any broken egg on them although to all appearances dry and inoffensive, there is danger. All such should be thrown out and clean fillers substituted. No matter how fresh the egg is that comes in contact with a dirty filler, it will soon be tainted. If the eggs are to be shipped to a distant market, no matter if but a few miles, they should be sorted to conform with the demands of the market. If there are both brown eggs and white, the brown eggs should be put in one side of the case and the white eggs in the other, a note on top of each side explaining how many of each. Grocers like this method because it saves them the extra trouble of sorting. If they have agreed to give you one price, it makes no difference. Make a statement of how many dozens of each—they will appreciate it Also be sure you send nothing but clean eggs to market. If you have pullet eggs keep them separate and ship as pullet eggs, if you don't you may possibly lose a good buyer. These are busy men and have no time to spend explaining. Never, by any chance, leave eggs out in the sunshine. Incubation starts very easily in the sun and from then on decay is very rapid. If obliged to carry eggs during the hours of sunshine, a good layer of green grass laid over the case will keep the direct rays of the sun from striking them.

Eggs for Hatching.—A revolving cabinet placed in a room where the temperature can be depended upon not to get below 50 nor over 60, is the easiest and best way to care for hatching eggs. If they have to be kept longer than five days, they should be turned from small end to large end down, or the yolk may settle, and if this must be done by hand it takes up considerable time. Eggs that are strictly fresh hatch the best, but it is not always possible to have strictly fresh eggs on hand, yet it is possible to keep the freshness as well as can be done.

Packing Eggs for Shipment.—When eggs are going some distance they have to pass through a good many hands and some of these hands are very careless. Others are just itching to play ball with every package that comes their way and the only way to do is to pack eggs so that these hands can all be accommodated and the eggs still come through in good shape.

For one, two or three settings, or even fifty eggs I have never found anything as good as a good chip basket. The very small size is not practicable, but the second size is large enough for one setting of eggs. The next larger size will hold two settings. The cost of the small one is ten cents, of the larger fifteen, and the one large enough to hold fifty eggs will cost twenty cents.

Line the basket with several thicknesses of paper or cardboard, then lay excelsior along the bottom and sides. Wrap each egg in a square piece of paper and in placing them in the basket put a little pad of excelsior between each egg. Keep laying the eggs in this manner until all are in, then tuck in well with more excelsior. The aim must be to have the eggs so solid in the basket that no amount of shaking will disturb them. If they can be shaken out of place they will not carry safely to their destination and you may as well go over the task again. There is just a knack in it and if you keep trying you will catch on. After you succeed in getting the eggs to stay, proceed to cover the package. I use clean burlap, but that is a matter of choice. Burlap is strong and will stand a good thick string to sew it on with. Use a packing needle, cut the cover a little larger than the basket, tuck the raw edges inside and sew burlap and basket all around right down to your excelsior filling. Paste a label with address of person eggs are for and your own address as shipper, and in extra large type the words: "Eggs for hatching, handle with care." Give correct value of eggs to express agent and advise your patron to collect if eggs are damaged in transit.

CHAPTER VIII

HOW TO BUILD AN INCUBATOR CELLAR

While we do not have the extremes of cold and heat they do in the east, it is necessary to have a place for incubation where an even temperature can be maintained the year round. To get this we must be partly underground. The very best material to build an incubator cellar with is hollow cement blocks. And these can be bought almost as cheaply as buying cement and having a man to build a wall. The wall should be from twelve to eighteen inches above the ground and four to five feet under ground. The size must be determined by the number of machines you wish to run, but always allow for expansion, for expansion is inevitable sooner or later; you never stand still in the chicken business. Put your windows in the space above ground allowing one for every ten feet of surface, but so arranged that you have windows on all four sides. Hinge the windows on the inside and at the bottom, then put fly screens outside. By this arrangement you have good ventilation and if the wind is blowing from one direction the window on that side can be closed, leaving the ventilators on the other three sides still on the job. There will never be any smell of oil or smoke in a cellar of this kind and the operator can attend to everything from the inside. If you fail to get good hatches in a cellar built like this, there is something wrong somewhere else.

The upper part of the building can be used as a store room or a packing room. But to economize, the space should be used for something connected with the business. Land is too valuable to lie idle, and having the foundation of a building already to hand, it is cheaper and better to run up a lumber building over the cellar. A feed room is a necessity and it would not cost very much in connection with the incubator cellar.

CHAPTER IX

HOW TO RUN THE INCUBATOR

After setting up your machine sit down and read the directions. Not once, but just as many times as it takes for you to get a good understanding of the maker's meaning. Some incubator manufacturers are more direct and plain in giving instructions than others, so it pays to have a good understanding before even lighting the lamp. After you have the lamp in running order turn your attention to the regulator. Keep unscrewing it until the heat comes up to 100 or 101, then place your themometer in a good spot where you can watch it and close up the doors. If the temperature varies, put in another thermometer as the first one may be incorrect. When your temperature reaches 102½ and stays there for any considerable time, your machine is ready for the eggs. But it is better to run it a day or two without eggs if you are a beginner, just to get acquainted. When the eggs are put in, give the machine plenty of time to regain the temperature. Some say twenty-four hours but most hot air machines will come up to the 102½ in twelve hours, but if it takes longer don't get uneasy, it will be all right.

Run the ventilation according to directions sent with the machine, because every manufacturer knows what his machine does best with, much or little vent, so it is better to go according to his directions. If the eggs are put in the machine in the morning keep the doors closed until middle of next day, then turn the trays from one end to the other. If it is a two tray machine change places. If a three tray, change the middle tray to one end and end tray to middle. Do not turn the eggs but only the trays until the evening of the third day. At this turning take only one tray out to turn at one time, and turn the eggs quickly. Then take out another tray and replace the tray that has been turned in place of the one just taken out. The eggs must not be chilled in the least, at this stage, so the work must be done as quickly as possible without jarring.

After the fourth day turn your eggs twice a day, and make a point of doing this work when you will not be interrupted. If there is any trouble that way, fasten the door, for incubating is a matter of precision and regularity.

Begin airing the eggs after the fifth day, and in this you must be guided by the temperature in the room. If it is up to 70 degrees the eggs can air a little longer than if the temperature is 50 degrees.

Animal heat begins to influence the incubator after the seventh day and your temperature will begin to work up, so you must give the regulator nut part of a turn every time the heat crawls up to 103 or more. But here it will be necessary to use judgment, because if you are operating in a cold room it will be better to run the machine at 103 and not air the eggs until later on; just turn them and put back in the incubator. In warm weather and in a warm room give plenty of air—the chicks need it. On the seventeenth day one or two hours airing will go a long way towards helping them break the shell. Put water in according to instructions with machine. Some incubators require more moisture than others so follow directions given with the machine you are operating.

Some Don'ts About Incubating.—Don't ever try to hatch brown and white eggs in one hatch; one or the other will not do so well.

Don't fail to fill your lamp and trim the wick, and be sure to wait around long enough to see that all is well; also don't fill the lamp too full. Many an explosion and fire has been caused from an over filled lamp.

Don't fail to test out all eggs that are not fertile or likely to hatch, because one bad egg contaminates others and poisons the chicks that hatch.

Don't open the door under any consideration after the eggs begin to pip until the hatch is practically through; then if any belated chicks need help give it quickly and close the doors. These late chicks don't often amount to much, but sometimes they are worth saving.

When all are hatched that are going to hatch, clean out the trays, open up the ventilators and give the chicks fresh air, but **beware of chilling.** Yes, it can be done even in the incubator, but when the chicks are quiet and restful you may know all is well with them.

Don't be in a hurry to set the incubator again, you will gain by keeping the chicks in the incubator for at least twenty-four hours, but forty-eight would be better. This rest in an even temperature helps the chicks to digest the yelk of egg that is to give the first nourishment and start in life, and if you once try this way you will never want to hustle chicks out of the incubator in order to start it up again.

When you do take the chicks out of the incubator throw it wide open, keep the heat going and get a fine spray (a small hand spray) and put in it a solution of creolin and water; one teaspoonful creolin to a pint of warm or rather hot water. Spray the inside of the machine with this solution; wash out the nursery drawers and egg trays with the same then shut doors and let it steam and dry. Wash

the lamp out, boil the burner in water in which you have put a tablespoonful of baking soda, then polish it up and it will be as good as new. Put in a new wick every time you set a new hatch and do as I tell you and you will never be bothered much with chicks having diarrhoea. Most of the bowel trouble comes either from chills or filth, either in the incubator or brooder.

Always use the best oil you can get. Some incubators will burn poor oil but all of them do much better with good oil. Whenever an incubator smokes you are using poor oil with a machine that calls for good, refined oil, or you have the lamp too full or the wick too high. Don't blame the machine but go to work and remedy what is wrong. If for any reason the egg chamber gets smoke in it, open the doors and take the eggs out until the smoke has passed away when it will be safe to return them, if you have cut off the cause of the smoke.

Don't forget that the egg is the chief source of moisture needed under ordinary conditions. If too much moisture is added the chicks drown, or they grow so fast that the shell is filled before the chick is due; then it has no room to work and it is a case of "dead in the shell." Don't forget, that when there is too much moisture in the incubating cellar the air does not circulate as freely as when the moisture is not so abundant. If you can adjust the moisture question the rest is easy. And except during the months of July, August and September we are fairly safe about the moisture on this Coast unless in some of the inland valleys.

Don't forget that irregular and inefficient attention to filling lamps and turning eggs are to blame for a large percent of poor hatches, and that these things are entirely under your control. Have a certain time to do these things and let nothing interfere with that duty.

Don't get excited if it should happen that your lamp gets in a blaze. Just go with a gunny sack or something that it not inflammable and get the lamp out of its place and carry it to a place of safety. Wrap a gunny sack around it and the fire will go out. Then open up the egg chamber so that if there is any smoke there it can escape. If the eggs are hot take them out and cool, being careful not to leave out long enough to chill, then return to the incubator. Don't start the lamp up again until you have cleaned up all soot that may have gathered in the pipes or heating chamber, because most likely you will have the same thing happen again.

In case of accident keep cool and your good sense will come to the rescue.

How Young Chicks Look The First Two Weeks

So many people do not know how chicks of the several breeds look when young and they sometimes think they have been buncoed when the chicks do not look just like the old ones.

All Black or dark chickens whether Minorca, Langshan, Leghorn, Wyandottes or Barred Rock, have splashes of white on them. These may be on the breast under the body, on the back and on top of the head. When the chicks feather out they will in all probability be perfectly colored.

In White Rocks, and sometimes in White Orpingtons and White Leghorns, there will be a greyish or yellowish cast to the white, but all that goes away and the birds in full feather are white.

Buff chicks of all breeds are sometimes quite light colored, and sometimes have little streaks of black in the down. In Brown Leghorns, they are striped a buff stripe and a black stripe all over the back or some would call it a brown stripe and a black.

Houdans are black on back with white under the breast. Rhode Island Reds are a richer buff and have more little spots on them as a rule. Sometimes eggs from white birds will throw a black chicken. This is considered a sport because it occurs so seldom.

According to Mendel's Laws, white is dominant and that, perhaps will account for the rare occasion of a black chick being hatched from eggs where there is positively no danger of mixing breeds.

How To Get More Pullets Than Cockerels

Mate your male bird with more females than ordinary and if they are older it won't matter. The eggs will not be so fertile as if you had less females with him but the bulk of the chicks will be pullets. And you can afford to lose a few eggs if you want pullets. Also the last eggs at the end of the season are nearly always pullets.

CHAPTER X

RAISING THE CHICKS

To raise good chicks, it is really necessary to go back to the stock and know what they come from, but we can't all do that so must start with what we have. If they have been bought from the Hatchery and come any distance, give the shipper credit for sending you good chicks and don't start in to spoil them.

Have your brooder ready, and that means strictly clean; and if it has been used before, to be clean it must have been washed or sprayed and every little odor of "chicken" removed from it. This being done have it running at about ninety degrees. Sprinkle fine ground oyster shells around and give the chicks fresh sweet buttermilk. If there is sour milk on hand churn it until it turns to buttermilk. Just give the shell and buttermilk for the first half day, then sprinkle a little rolled oats on a board for them to pick at. For the first three days care must be taken not to feed much at any one time, but just what they will clean up in a few minutes. After the first day mix equal parts of dry bran, chick feed and rolled oats with a little ground oyster shell. This is for the general feeds to be changed off with appetizing bits, mash, green feed, etc. Always remember that too much rolled oats is laxative. This can be offset by cutting up a stale loaf of bread, toasting same brown all through in the oven, and then grinding it in a food chopper or coarse coffee mill. Wet, or rather, moisten this ground toasted bread with a little hot water or milk and feed when cool. And here you have one of the finest and most nourishing chick feeds possible. Another nice way to serve stale bread, and it can usually be bought for 25 cents a sack, is to toast as above, grind and put in food hopper dry. They love to pick out the dark colored crumbs and this is a good feed for chicks.

About the fifth day give them a dry mash. The mash should be two parts good wheat bran, one part middlings, one part cornmeal or fine ground barley meal, one part rolled or pinhead oats and one part good beef scrap. Mix all together adding only a very little salt, a little charcoal and some ground oyster shell. This mash can be kept before them all the time and they will never eat enough at one time to hurt them.

As the chicks grow, increase the quantity of chick feed adding a little extra cracked wheat to the bill of fare. No matter whether you

buy chicks, hatch them yourself in the incubator, or have hens hatch them, this method of feeding will be good enough for all.

(Editor's Note: We realize that many readers will consider the above methods of boiling and varying the feed for young chicks too bothersome and time consuming. This applies particularly to those who wish to conduct the poultry business on a large or commercial scale.

It has been proven beyond doubt that reliable manufacturers of commercial chick feeds furnish Dry Mixed Infant Chick Feeds, composed of small grain, seeds, charcoal, grit, etc., that supply all the chicks' wants, and if properly fed, seldom fail to raise a very large percentage of properly hatched chicks. At times every healthy chick, even in lots of four or five hundred, has been safely carried through baby chickhood by the feeding of these commercial chick feeds.

To be perfect, the chick feed must contain a small amount of grit and shell, which should be thoroughly mixed through it. The question of grit and shell is very important and if the chick feed you buy does not contain these ingredients, be sure to secure them and mix them in yourself to the amount of 5 per cent.

In Bulletin 164 of the University of California, Prof. M. E. Jaffa says, "The Grit and Charcoal are added to the chick feed, as the babes can not at first be depended upon to visit the grit trough regularly; but the trough is placed in the run to teach them to acquire the habit for the future."

This matter of grit in commercial chick feeds has recently been given attention by the Federal Government. The Bureau of Chemistry of the Department of Agriculture recently ruled that "A certain amount of grit is considered a food and when the amount is not excessive, no statement in regard to the quantity of grit is demanded by the Federal law.")

Extras.—The above is the straight everyday diet but unless it is varied chicks soon get tired of it. Now the first and most valuable way to vary the chick's diet is to give it some succulent green feed. These things should be prepared ahead of the chicks so as to have them ready. Now I class nice fresh tender lettuce by itself. There is nothing chicks like better, nothing that they can eat so much of without being harmed. I never knew a chick that ate so much lettuce that it was hurt by it, and I have known them to be harmed by eating too much of other good things. If possible, I always aim to have a bed of lettuce ready when I have a hatch coming off. That is how much I think of it.

Next in favor is chicory. This plant is the nearest elements to lettuce of anything I know; besides it is tender, succulent and bears cropping well, as it is almost perennial. You can cut the tender leaves and come again without injuring the plant in the least and chicks like it.

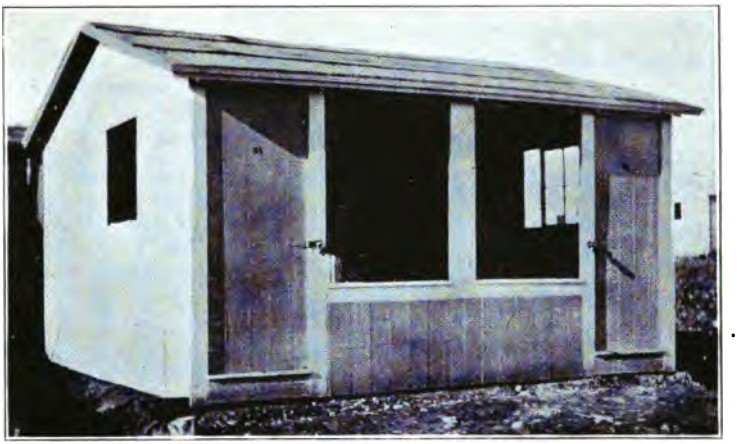
Rape is another nice tender green for little chicks but unlike chicory it lasts but one season. Sow the seed as you would lettuce in rows, and it can be cut from four to six times in a season. Every new growth of leaves is tender and fresh for the chicks.

Kale is a most excellent green and more will be said about it later; for small chicks I do not think its use advisable.

Sprouted oats are a green and grain food combined, and it is better than anyone has ever given it credit for, and that is saying a good deal. But it is not as economical as many other forms of green food under the regular conditions. That is, if a person has plenty of vacant land he can grow other foods cheaper than he can buy the oats and sprout them, and with less labor. Therefore, my reason for calling attention to sprouted oats is because it fits in with the fancier and the city or surburban poultryman who is short on land but long on patience and the desire to make the best out of his surroundings. With oats at $1.80 to $2 a hundred pounds, the average poultryman fights shy of them, and yet when processed right, one bushel makes about four so that the price is cut considerably. Oats are just as valuable to poultry as they are to horses. They simply stand for bone and muscle, health and energy and a good coat of feathers. In another part of this book I will tell you how to sprout oats to the best advantage for both chicks and grown fowls.

Watering the chicks looks such a simple thing to make an item of in the making of a book that most writers leave it out. But it is really an important factor in the raising of the chicks. As before said good, fresh buttermilk should be given the chicks the first half day, then pure water. I prefer to give boiled water for the first ten days, and always give it warm in the early morning. Now suppose you have one thousand chicks, you will want five gallons of water boiled, to supply the chicks a day. I don't think they will be stinted at all on that and it is not such a very big chore to set a five gallon oil can on the stove and boil that much water the evening before it will be used. Then the next morning, set the tea kettle on to boil while you eat your own breakfast and then you have the warm water by mixing that just boiled with what was boiled the evening before. Remember it is only for a few days to give the chicks a chance to get a good strangle hold on life instead of being fastened upon by millions of bacteria.

About once or twice a week they can have buttermilk or sour curd if you have it. The acid contained in milk is appetizing and healthful. In fact there is no objection to feeding milk every day, but the chicks should also be served water; then let them take their choice. To the bill of fare for chicks may be added Johnny cake, once in awhile a kettle of boiled rice and pin head oats, a beef heart boiled and cut up in strips then thrown in for them to enjoy and race for and a mess of small potatoes boiled and mixed with a little mash



Partially Open Front Poultry House

Open Front Poultry House with Wire Front

material. This is about as wide a ration as is safe for chicks that are intended for breeders and layers.

Bowel Trouble In Small Chicks

Bowel trouble in small chicks is nearly aways some form of diarrhoea, and in nine cases out of ten it might have been prevented by careful feeding and brooding. Chicks are either fed too much or the food is of such a nature that it takes a long time to digest and the feeder adds more fuel to the already overloaded furnace. Undigested food may sometimes be found in the droppings but as a rule it is not noticed.

Chilling Is A Common Cause.—But more ofter the diarrhoea of small chicks is due to a chill at some stage of the game. The brooder is too hot and chicks get out, then fail to get back. Just a few may start with a looseness in the bowels, and in a few days it has spread to the whole flock. Don't forget that in diarrhoea there are alwaye germs to be reckoned with, and germs multiply.

Sanitation Needed.—It is always best to find the source of the trouble if possible, but no time should be lost after a case shows itself. Simple measures are the best. Spray the brooder and brooder house with the creolin solution, boil all the water that the chicks have to drink and feed more dry grain.

The chicks must be kept comfortable and if they have been overcrowded, separate into smaller flocks. Both overheating and chilling are fore-runners of diarrhoea and should be equally avoided. It is really better to supply a variety of food and keep it before them all the time, than it is to be continually giving them more of one thing than they can eat. Let them balance their own ration if you have failed to do it right. Keep a good supply of ground oyster shell and charcoal before them as both these are needed to absorb gases. Give them raw vegetables on clean boards—lettuce and any form of green feed.

Remedies.—If the water is boiled and given cold, that alone is helpful, but the next best remedy is to pour a gallon of boiling water over a piece of quick lime as large as an egg, stir well, then let all settle and when cold give the chicks the clear lime water to drink. This is also a very effective, yet a simple remedy in all cases of bowel trouble for young and old. It may be given for one or two weeks at a time without any harmful results. The Homeopathic remedy for diarrhoea in small chicks is Mercurius Viv, a dozen pellets in the drinking water, say one dozen to the quart.

CHAPTER XI

WHY CHICKS DIE IN THE SHELL

This is a very vital question to every poultryman, every hatcher and anyone who hatches several hundred chicks in a season. Moreover, it is a question that is so many sided that one must have had many different experiences before he can answer it at all. And I believe that in more than forty years work with poultry I have had experience along most of these lines and found out some few reasons "why chicks die in the shell."

One reason, and I may say the most frequent cause of chicks dying in the shell is poor management of the incubator. Poor management includes irregular heat, incubator run at high temperature for a few hours, then run low, and in the efforts to maintain a regular temperature the eggs get a good many variations. While they will stand a certain amount of abuse of this kind at some stages of incubation, at others the eggs are very easily affected and it is at these critical stages of incubation that the embryo is weakened and robbed of that vigor that should be in reserve for the final break into the outside world.

Another cause is lack of exercise of the eggs, here we should take a lesson from a good setting hen, not a lazy hen but one with the natural motherly instinct strong. After the first three or four days she rolls and rolls her eggs every day and perhaps several times a day, and if you notice nearly every egg will hatch from a hen of that type. A lazy hen, and there are lots of them, may be given a nest exactly like the other hen, with exactly the same kind of eggs and she will have chicks dead in the shell, chicks that are crippled and all kinds of trouble, just as some people do with incubator eggs. The reason is she did not exercise them, did not roll them and the muscles did not develop. "Muscle!" you say. Yes, muscle and energy to use the muscle; it takes both for a chick to dig it's road out of it's prison into daylight. After the seventh day roll the eggs around every time you air them and turn them, never mind marking eggs so as to tell which side they were up or which side down, but roll them around like the old hen and let them take pot luck as to which side they happen to go to bed on.

And yet another cause in the incubating is lack of knowledge in adjusting the moisture. A great many chicks are actually drowned in the shell. You may know when this happens because there will be

a glutinous substance inside the shell. Lack of moisture dries up the inside skin and the shell peels off, leaving the chick stranded inside because it cannot work on that dry skin, hence it smothers.

The last and most fatal cause of chicks dying in the shell is because the chick has outgrown its quarters and has not room to work.

The word **cause**, in the above sentence is wrong. The size of the chick is simply the effect. Every cause has its effect, as every effect must have a cause which precedes it. The question that interests us at present, is what causes the chick in its state of embryo to outgrow its habitation. First, the temperature of the incubator if it is run too high during the last two weeks. Second, too much moisture, perhaps too much of both heat and moisture. If to these we add too much light we have a natural condition for quick growth, whether in the shell or out. Life is there; fulfill the natural conditions required and the life will grow to that stage nature has allotted to it.

And in this connection I am going to give you one more reason for this growth that leaps its bounds so that the chick at the time it should break the shell cannot do it and it dies in the shell. We look at it and say: "My! but it is a shame to see that big fine chick die in the shell. What it the reason?"

The reason is this: We set the eggs at the time that suits our convenience, regardless of what nature has to say about it. A few old fashioned folks still consult the almanac as to whether the moon is right for planting potatoes and other garden truck, but how many ever dream that the phases of the moon could influence the growth of a chick in the egg. And yet I tell you, friends, it does.*

It is certainly strange that people will accept half of a truth and refuse to let their mind expand to receive the whole truth. No one ever doubts the fact that the moon influences the tides, because that has been an accepted fact so long that it is not even questioned. But tell them that it also influences the earth and animal life too, and they laugh.

It won't cost anything to set the incubator so that the chicks will hatch some time during the first quarter of the new moon. I have found that when eggs are set in the new moon the embryo grows too fast during the first days of incubation. Having used up its energy in making this rapid growth in those first days, the chick is much weakened for the final break into the world, and being overgrown it is a little inclined to laziness too, so dies rather than make an effort to live. You have probably heard of the lazy man, every State in the Union claims him. This particular lazy man came from Indiana and he was so poor and so good for nothing that the town decided to bury

* We dissent from all the moonshine which follows—but to succeed with poultry one must learn to be watchful and systematic and learn to do things at the right times. If he begins by faithfully watching the moon he is likely to learn to watch other things which matter much more.—EDITOR.

him. As they were hauling him to his final resting place a man inquired what he was to be buried for, when he was apparently alive. On being told, he said: "I will give the man some corn. Take him back." The lazy man was told of this offer and he softly inquired: "Is it shelled?" "No," the charitable man said, "but you can shell it." To this the other merely said: "Drive on." He preferred to die rather than shell the corn and I believe that is the case with overgrown chicks, they prefer death to the effort of pipping the shell.

Now as I have already said the elements for growth are light, heat and moisture. The eggs contain enough moisture under natural conditions to incubate and bring to a successful hatch the germ within them. Now if the eggs are put in the incubator, the glass doors covered or darkened so that no light penetrates to the egg chamber except when the eggs are being turned and aired, the heat kept at a rather lower temperature than usual, say 102½ for a few days, then if it is desired run them at 103, providing moisture according to directions sent with the incubator. I believe you will not have so many "chicks die in the shell."

If, in addition to these precautions you will set the incubator when practicable, so that the chicks will come out during the growing moon, you will not only reduce the dead in the shell chicks but the chicks you hatch will grow so fast that you will wonder why some **crank did not put you wise before this.**

I told you in the first place this would be a different kind of a poultry book, and I am going to make good. If you have a baker's dozen of poultry books you still need this, because it will tell you things you will not find in any other. I am strictly unorthodox, I never travel in ruts; when it so happens that I fall into a rut, something comes to jerk me out.

CHAPTER XII

A FEW DONT'S IN RAISING CHICKS

Don't ever put a second lot of chicks on the same ground that others have been on, or in the same brooder or house until every trace of the first lot of chicks has been obliterated as far as possible. The first lot of chicks clean up everything in the soil that is worth having, leaving nothing but their own dirt and odor. And these are poisonous to the newly hatched chick.

If compelled to run the chicks on the same ground, clean the top dirt off and cart it away. Soak a bucketful of oats, a little millet and rape seed and after spading up the ground good and deep rake in the soaked seeds.

Spray the walls and floors of the brooder house with a mild disinfectant, scrub, if necessary, the brooders, hovers, etc., until they are as sweet and clean as when new. When every trace of the smell has disappeared, the place is fit for the new hatch, and not till then. No poultryman with self respect will put newly hatched chicks in dirty, ill-smelling brooders.

Don't leave food out in wet weather and expect your chicks to be all right, because they won't be if you do. Feed of all kinds sours very quickly in moist weather, and sour feed causes bowel trouble. If by accident this happens, the surest remedy is to move the chicks to new ground if possible, feed nothing but dry grain for a few days or boiled rice and cinnamon, charcoal and grit. If, however, the runs are fixtures and cannot be moved, spade up the ground and put as much sand on it as you can, with a little air-slacked lime buried under the spading.

Don't feed newly hatched chicks incubator eggs. They have been living on that diet for some time and need a change. After ten days you may feed them in moderate quantities. But the best way to feed them is to use them in making a Johnny cake.

Don't —Mix sweet and sour milk. That is if you feed sour milk or buttermilk one or more days, don't change off and feed sweet milk, just because you happen to have it. This is a sure way to cause bowel trouble. Bowel trouble in young chicks that have started right is nearly always caused by wrong feeding, generally through giving tid-bits that they would be far better without.

Don't—Fail to keep your brooders clean, well aired and free from bad smell. For the first few days they will do very well let alone.

After that clean them out every day and they will pay you back in quick healthy growth of the chicks.

Don't—Fill the brooder box or hover with fine dust or dirt. It gets in the chicks' lungs, gives them canker in mouth, and is altogether wrong. The best way I ever found to keep a brooder clean was to spread burlap on the floor, fit it in corners as you would a board, then put nice fine cut litter over the burlap. When you want to clean out just draw out the burlap take it out doors and shake the contents off. By having two pieces of burlap one can be washed and hung on the fence to dry while the other is in use. Or, if you have no litter, just sprinkle clean sand over the burlap. This saves dust, saves time, and better still it saves the floor from getting such a strong chicken odor.

Don't— And this is the biggest don't and should be printed in red letters: "Don't overcrowd." All brooders, hovers, etc., are sold with a capacity that is very much overstated, in the first place, and no allowance is made for the growth of the chicks. The capacity is for day old chicks, and as the manufacturers have to sell in competition with others that are so rated, we cannot blame them. Then the poultry man happens to have a matter of fifty chicks or so extra, and he puts them in and his brooder is now carrying nearly double what it was rated at. By the time the chicks are two weeks old they commence dying, not from lack of room perhaps, but for lack of something more vital—air. Even if the chicks live, some of them will be stunted and will be more or less of a loss.

Overcrowding is not a question of room only; in fact the room is secondary. The vital point is in the "quantity of air." If there is air for fifty chicks and one hundred are put in, don't you see that every chick is being robbed of just half the air it should have to keep it in health and strength?

I have seen chicks come out of brooders so weak they could not stand. At that time I did not realize what caused the weakness; the knowledge came later.

Under natural conditions all varieties of land and water fowl are hatched and brooded in small groups or families, and sometimes in lean years, air is the biggest asset they have; but with plenty of fresh air and a little picking here and there and the warmth of the mother hen the little broods manage to grow into lusty youngsters, and there is no such thing as their "going light." That condition is left for the brooder chick that has been robbed of its pure air. With properly ventilated brooders, we can improve on the natural method of brooding so far as numbers, but when one thousand chicks are confined in a space where there is only air for five hundred, there is something wrong.

Just recently a man told me he bought two brooding devices that were sold to accommodate one thousand chicks each, but he said: "I saw chicks that had been brooded in one thousand lots under them and I did not want those chicks, so I will brood three hundred where my neighbor puts 1000." This man's philosophy was sound and his chicks show it. Chicks that are raised in plenty of good pure air will pay their own board bill and their owner's too. So "don't forget" that overcrowding means robbing the chick of the elements of growth, health and even life itself.

Most people think of overcrowding as stinting space only. If that were all, some way could be found to make up for the lack of space, but as we have shown, it means more than space. A brood of chicks that is robbed of air will dwindle down so as to regulate the question of space themselves.

CHAPTER XIII

BROODERS AND BROODING SYSTEMS

First we will consider the small brooder, as the average farmer or small poultry man does not need a system, but just something that can be relied upon to brood a hundred or two hundred chicks without building special brooder houses.

For this I do not know of any better than one that has been gotten out by the International Correspondence Schools.

The "hover" is round and made of galvanized iron; the lamp sets in the center, making it absolutely safe, because even though the lamp got on fire it is confined in the metal frame and the blaze cannot get away. My belief is that if the lamp should run very high through bad management, that it would smoke and clog up until it went out. But after using two all one season I see no reason for any accident happening at all. They have been thoroughly reliable. The good feature outside of the safety lamp is that there are no corners, no closed boxes; the chicks are all around the hover, a curtain of canvas hanging down and they can run under or out at leisure. Yes, there is another good feature and one that will appeal strongly to the farmer. These hovers can be set in any small house, shed or barn and the chicks raised just as well as if they had a high priced brooder house. When the chicks are through with them they can be carried to another house in one hand, they are so light and handy. These can be purchased from poultry supply dealers.

Brooders for Outdoors.—There are other small brooders for outdoor use, or they can be bought for indoors without the little house part. One hundred chicks is usually the capacity, though there are people who crowd more into them.

The Stove Systems.—There are several of these stove systems on the market, and they must all have some merit or they would not be bought. With most of them the chicks are all out where they can have what air the brooder house contains, and so that is in their favor. But the idea of twelve or fifteen hundred chicks being confined in one house is entirely wrong. If, as has been the case, the stove becomes faulty and either goes low or goes entirely out, just think what will happen to those chicks. I know they have just about perfected some of these stoves and put automatic alarms on them so that the danger is not nearly so great as one might think, but even if they were perfect, there should never be such a number of chicks together in one place.

DOUBLE POULTRY HOUSE OF W. G. SUITS, AT RIVERSIDE

The George Hover.—A great many of the big poultrymen are using the George brooder or hover. This is a stove too, but the chicks instead of being around the stove in a circle are under a hover, where warm air passes through and around them. In case of accident to the stove, the chicks would in a measure be comparatively safe, because the heat from their own bodies would keep them warm, being confined by the top of the hover. This is all the advantage I can see in the hover over the stove. The same number of chicks are crowded together with the same difficulty, namely, a shortage of fresh air. Twelve or fifteen hundred chicks must consume barrels of air and the bodies of so many chicks must be exuding barrels of foul air. Now if the intake of fresh air does not enter a hover or building in excess of the foul air being sent out from these bodies, you can imagine what the results will be.

The results will be poisoning from carbonic acid gas. The chicks may not die in numbers but the poison is there and unless they can throw it off by open air exercise during the day, they will stand a poor chance for a long and happy life.

The only remedy for this is to reduce the number of chicks to half, and I believe poultrymen would get much better results.

The Hot Water Pipe System.—Like the preceding systems, this also is expected to brood large numbers of chicks together, and exactly like them, the weak place lies in the number congregated together, no matter what the system may be called. However, this tubular hot water system has one advantage. It can be set in the center of a house running as long as you wish, and if it were desired, it seems to me that the chicks could be divided into small runs, running each way across the house. This would be much better than having the chicks all scrambling together. The hot water pipes are covered over by a platform, that forms a hover for the chicks, and as they can run out either side there is not so much danger of crowding. The air supply is the one thing that needs watching in all these systems where crowding large numbers of chicks together is practiced.

The One Perfect Brooding System.—This is a brooding system that has no strings to it so that any one who is mechanically bent can make one after it without fear of infringing on patents. Mr. Norton, the man who invented it for his own use, is a mechanic by trade and given to studying out the whys and wherefores of anything that bothers and perplexes him, and as he had been much perplexed over the brooding of his chicks he set himself the task of inventing something that he could rely upon. As it is difficult to get pictures of such interior places the only thing to do is to try to describe this brooder system so that you can see it for yourselves.

This is something of a task, but if we try, that is all that can be expected of us whether the result is success or failure. The brooder

house is 16x150 feet and is separated into runs entirely apart from each other. Each hover is 3x4 feet. The runs lead outdoors to other runs so that each lot of chicks is separate whether indoors or out. Thus a person can stand at the door of this brooder house, in the end of the building, and look down where chicks of all ages up to three months can be seen; or on other occasions one may see three thousand chicks of one age, yet separated in small lots with their own hover and run.

The system of heating is with pipes, the pipes being below the floor about eight inches and confined in a box made of inch lumber. At the top where both heat and air ascend it is partially confined so as to make the heat diffuse better. At the top of the hover is a burlap that acts as a diaphragm to carry the heat over the backs of the chicks. At the front of the hover a curtain keeps in the heat and all over their backs this mild, warm air is on the move all the time. If it is desirable to close up, or rather shut off the heat from one, two or several hovers, a piece of board with holes the exact size of the ones that let in the heat and air, is right there and can be placed over the heating apertures and thus shut off for as long as necessary the heat from any number of brooders. From 50 to 75 chicks are as many as Mr. Norton cares to put together. He is in the hatching business, and sometimes has just a few chicks left over. Another time he may have a hatch come off that he has not sold, and he always has a place to put them where they will be kept warm and comfortable. The death rate is very low, as one would expect where such small lots of chicks are kept in almost perfectly natural conditions. The hot water pipes are heated by an oil burner. Being confined in the box under the floor it does not take very much heat to keep them hot. Now if this is not plain it ought to be, for it looks so easy to me that I could make one myself (if I were a carpenter).

The heat from this brooder is indirect heat and the warm air is always coming up, because that is the natural outlet, as warm air can never go downwards.

The George system is something after this plan of warm air coming upwards, but where twelve hundred chicks are in one body it would require volumes of air to furnish all they require. By distributing the chicks in smaller lots they have a better chance. Overcrowding is the greatest mistake of modern poultry raising. We want to bunch chickens up like plants, and like the hothouse plants that are given too much heat and too little air, chickens grow spindly and weak with no constitution or vigor. Chicks that are overcrowded fall easy prey to disease, and instead of being a source of income they are a continual source of expense.

With a brooding system where the heat is direct, the chicks may be kept just as warm and comfortable as with indirect heat, but they are not getting the movement of fresh air. By the direct heat method

the air around the chicks is stagnant. Consequently the chicks breathe and rebreathe the same air over and over again.

To chicken raisers this will mean a great deal when they once realize it. We have been brooding chicks artificially a good many years by the direct heat methods of various kinds, and the secret of getting fresh air by indirect heat has not been properly appreciated yet. When it is, all other methods will go to make room for the best.

The large hovers and systems lessen labor; that is the only excuse for having them, and if the air currents can be enlarged so that the chicks can get a moderate amount of fresh air, nothing will displace them. Labor is an important factor in the successful management of a poultry plant. The profits are so small that it is absolutely necessary to minimize expenditure in all possible ways. Crude oil can be burned in all these large systems, and that is as cheap fuel as we ever expect to get.

The fuel question is very easily answered, as so far, nothing cheaper has been found to substitute for crude oil.

The Sandbox Brooder and Its Construction.—The sandbox brooder was used by T. B. Purvine last year to care for 12,000 chicks hatched by himself. About 9,000 came to maturity. A box is made about 20 feet long and one foot square, laid lengthwise of the house. Through the center of it a terra cotta stovepipe runs from a wood stove to the chimney. Around the terra cotta pipe, the box is filled with sand. A low hover is placed over the box while the chicks are small, and removed to make room for roosts later. Half a cord of wood is used to brood each brood of chicks, from 800 to 1000 at a time. With this sand brooder there is no gas in the air and extremes of temperature are avoided, because the sand is not easily overheated and does not lose its heat quickly if the fire dies out. Mr. Purvine has fourteen houses all equipped with this system.

CHAPTER XIV

THE BUILDING OF BROODER HOUSES

There are several things to keep in mind when building brooder houses for small chicks. There must be just so much warmth. Whether it is to be all artificial warmth or whether we can conserve some of the natural heat of the chicks by eliminating the cold air, is the question.

This much I have proven, that thin walls are not good for a brooder house. Too much cold gets in at night and too much heat during the day. This makes a very irregular heat that does not add to the comfort of the chicks, nor to their health. One-inch lumber of the shiplap or other matched varieties is the best material for a brooder house. The thicker the wall the more cold it keeps out and the more we conserve the natural, the less artificial heat need be used to consume the oxygen in the room.

Where direct heat is used, the burner is usually placed in the center of the room, and very few methods of ventilation have so far been sufficient to cope with the amount of oxygen consumed by this burner.

More chicks die from a lack of oxygen than from shortage of heat; one thousand chicks require, and must have, if they are to be well brooded, an immense volume of fresh air. Now with ordinary methods of heating, the heater consumes half the oxygen the method of ventilation allows for, so here is the problem. If fresh, warm air can be conducted into the brooder house in sufficient quantity, very few chicks that are at all fit to live will die. Hence the idea of conserving what heat is possible by building with this view in mind. Good walls, a good roof and a warm floor are great aids along this line.

For most of the brooder stove systems in use now, the size of house called for is 14x16. Some I have seen were 12x14, but the large size prevails. These houses have windows in all four directions, but they are small and set well up away from the floors. Too much light causes toe picking and other cannibalism in chicks.

One of our prominent poultrymen is quite well satisfied with this system of brooding. He finds the pullets are more gentle, therefore easier to handle than when brooded in small lots. This is quite natural because the tender is continually going in and out amongst them. In another case, one of my neighbors lost a number of chicks just a few days old because a man shouted to him near the brooder house; the chicks stampeded like so many cattle and before he could separate them, quite a number were suffocated. This, too, is natural. When

chicks are only a few days old, they certainly do not understand what noise means, and get frightened. So quietness should prevail until the chicks get a line on what to expect from the tender, then they will be gentle and docile. It is not so much the system after all, as the man who operates it. All these systems have good features, and every poultryman who is in need of one, should investigate the merits and demerits of each before investing his money. One lot of chickens properly brooded will often pay for a good system; while if it should not prove to be good, it is enough to experiment with.

How to Make a Fireless Brooder

The theory, or working principle, of a fireless brooder is that the heat of the chicks furnish enough heat to keep them warm. And this is true, but every particle of that heat must be conserved. If it is allowed to escape, the result will be chilled chicks, or what is worse, chicks that have been huddled up in a bunch and got sweated.

Fireless brooders are rarely successful except in small hatches. Twenty-five to fifty is enough to put in a fireless brooder and in all cases the fireless brooder must be in a building. A box 2x3 feet long and eight to ten inches high will accommodate 50 chicks until they are six weeks old.

The cover should be hinged from the rear, so that when the chicks are out, the box cover may be lifted up and aired. The hover part, the cloth that hangs down on the chicks' back, is laid on cleats for handiness. By being loose it can be taken out and set in the sun during the day and the whole brooder be kept sweet and clean.

Nail cleats on both sides and ends about two inches from the top. Make a frame to fit loosely on these cleats. Tack a piece of soft material, such as flannel or Canton flannel on to the frame, allowing it to sag in the middle just so that it will rest on the chicks' backs. On this should be laid a strip of cotton batting double, or more if the weather is cold. Bore small holes at each end of the box, just above this hover frame, for ventilation.

Now we are all ready for making the nest for the chicks. Remember, we have to conserve the heat and protect the chicks from getting away from each other into corners were they might get chilled. If we keep this in mind, it will aid us in making a snug nest that will keep the chicks warm and safe.

Get some soft short litter, chopped straw or hay is best, and with the hand go around all the corners, sides and ends until there is a good warm lining of litter. Now make the nest after the fashion of a saucer with about four inches of hay or litter in the bottom. Put on your hover frame, cotton batting and cover with the lid over all. This

should be fastened with a hook and eye. The entrance should be about eight or ten inches wide and three or four deep, as chicks do not like to go through a very small opening. When the chicks are in, put your hand in to see if all are snug and if so cover up the entrance with some of the litter. These are the best kind of home-made brooders and can be made of flooring boards, or ceiling boards, but some kind of matched lumber is the best if only one box is used.

CHAPTER XV

POULTRY APPLIANCES

If you are going to hatch with hens, you must have a system. Do not have hens sitting around the house in all kinds of places where it is next to an impossibility to attend to them. A room or shed 12 feet long can be made to accommodate twenty hens, or more if it is worked right.

A Natural Hen Incubator

Build a box, without top or bottom, 18 inches high, 10 feet long and 8 feet wide. Run partitions, one foot apart the 8-foot way, making compartments 12 inches by 8 feet. Divide these compartments in the center into two, making them 12 inches by four feet. This will give you 20 compartments. At the ends, away from the middle of each compartment, take a board 6 inches wide, 1 inch thick and ten feet long and nail across at the top, tacking it to each partition. This board should be nailed so as to leave an opening 18 inches at the ends away from the center partition. Hinge doors to these boards, having the doors 18 inches by 3 feet, except one, which will have to be 18 inches by four feet. Thus each door covers three nests at each end, except one, which covers four. The space in the center, between the two 6-inch boards, should be covered with wire netting, 2-inch mesh. This makes the top, and the ground is the bottom. Raise up the covers and put your nests in next to the ends. Use two bricks to keep your nest material from working away. Put a shovelful of dust and coal ashes in each compartment, next to the dividing partition, away from the nest end. Put water and feed at the other end as far away from the nests as possible and toward the dust pile. Change the water every day and see that the hens come off to feed. This gives a quiet, cool place to set hens, and you can go along each day and raise up the cover and see if your hens and eggs are all right. The hens are never allowed out of the run, as you have room for water, grain and green feed, right there to their hand all the time, also one of the best of dust baths, as nothing beats earth and ashes.

This incubator will hatch more chicks than many of the 500-egg machines. If the hens are all of good size and it is set full and fifteen eggs to the nest, you ought to hatch 250 good, strong chicks in the natural way with no more expense than the few cents for wire and a few boards, that can most likely be found lying around the ranch. One year I hatched over 700 chicks in such a natural incubator, and they were good chicks.

Very little can be done to improve the hen's method of handling eggs, but if the eggs should get dirty, they should be taken out and washed, while the hen is feeding. Filth should always be washed off eggs if they accumulate any. If the weather is dry and hot at hatching time the nest can be sprinkled with warm water and the hen will do the rest.

A Home Made Oat Sprouter

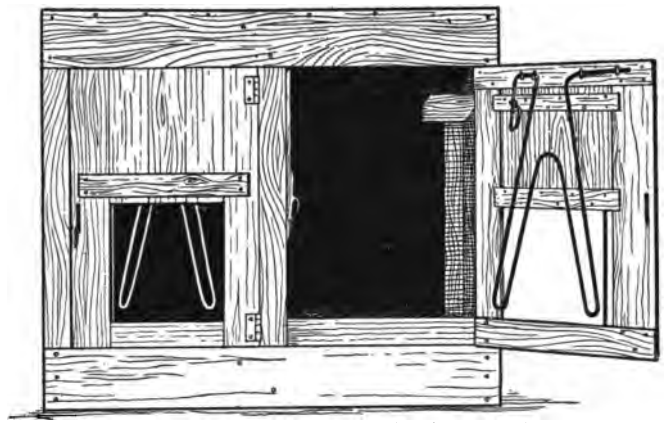
Make a set of boxes, any size you wish, without bottom or top; make a frame of two upright boards say six feet high and fourteen inches wide, now nail cleats on these upright boards about 8 inches apart; put a board on top as a stay and another on the bottom. This is the frame for your bottomless boxes, so the boxes must fit the frame. Now get double pointed tacks and good burlap and tack burlap bottoms in your boxes, fill the boxes about four inches deep with oats or barley that has been soaked several hours and sprinkle from the top. It should be set out of the wind as much as possible against some building, and in winter if you have a shed to put it in the sprouts would grow quicker.

Another Sprouter.—Make a frame of 1x6-inch lumber 3 feet wide by 8 feet long. Place this frame on hard ground and spread inside a bushel of oats that have been soaked over night. Cover the oats with 1 inch of loose earth and water every day. When the sprouts show through it is ready to feed. Then with a garden hoe, work under the roots, pull them up straight and you will have the best egg maker on this continent. Every hoe full has a big lump of dirt on it and lots of small animal life which the chickens will use to good advantage.

How to Build a Cheap Trap Nest

A trap nest to be successful, must not only catch every hen that enters, but must prevent the entrance of other hens. The one here shown does that to perfection and is very simple to understand, as well as to construct. In constructing one of these trap nests the gate is made of thin boards, cleated top and bottom, and should be about 12x18 inches. A hole is sawed in the lower half 8 inches square. A small gate is made by connecting two pieces of wood together with three wires 8 inches long. Holes are bored in each end of these pieces of wood, so the gate may slide up and down on two upright wires that are fastened to the gate cleats. This gate is held up by a wire trigger, having a shoulder bent on one end, on which the gate rests when open. The closed door shows that the same kind of a wire shoulder is used to fasten the door, which is done by simply pushing it shut. To open the door this latch is raised with the thumb until the door is released.

These doors may be fitted to any kind of a box or barrel, but it is best to nail a 1x4 up edgewise across the box, about 4 inches from the

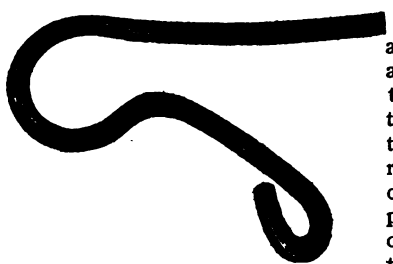


View of trap nests—The left-hand one is closed and the one on the right open to show triggers.

front, to keep the nesting material from interfering with the gate. This also makes the hen more certain to trip the trigger in entering the nest.

The partitions of the nests are made mostly of cheap muslin, and extend from the platform to the roof, so that the hens cannot roost on them. The fronts are made in one section and held in place by three nails, partly driven, so that they may be readily removed should the interior of the nest need spraying or whitewashing. The cost of making one of these doors with the gate and trigger attached is about 25 cents each, so that there is no excuse for a handy man being without trap nests on his poultry plant

Handy Poultry-Catching Hook



Improved hook—part of poultry catcher.

There is nothing belonging to a poultry ranch more useful than a good catcher. Some folks call the dog, the children and even the neighbors when they want to catch a few hens. Now the right way is to have a good piece of poultry wire made into a small panel, drive the flock, or part of them into a corner, set up the panel and catch the fowls quietly one by one with this handy catcher. In fact, it is just as

well to have several of them and keep one in each yard, then if a bird shows any signs of sickness, it can be caught without having to stop to think where you left the hook, and then run after it. The hook is made of a six-foot piece of No. 10 steel wire and a broom handle. The hook is so bent that it is larger where the shank of the fowl is held than at the opening. Thus the fowl is not injured when caught and it cannot get away. The wire is less conspicuous than the wooden end which attracts attention when you slip the hook over the shank. The wire may be braced and made stronger by wrapping it with No. 8 steel wire for the last two feet next the handle, or it may be made of wire alone, braced the last four or five feet and a hook made to hang it up by.

How to Make An Egg Tester

Take an empty box that has been used for breakfast foods, an oat box is generally the strongest. Cut off one end, and then cut away the pasteboard (on one side) on a curve so as to come against your forehead. On the opposite side, make a V-shaped opening to fit the nose; in fact, you want to fix this pasteboard box so it will come up tight and close around the eyes, nostrils and forehead. When put up against your face you have a dark box. In the opposite end of the box make, with a small-bladed knife, an oval opening. It should be just about the size and shape of a good-sized spectacle glass. The egg is to be held up against this opening, on the outside; but in order to have it fit tight against the pasteboard you must paste around the opening a circle of dark-colored cloth. A piece of black muslin is good. The idea is to shut out every particle of light that might get in around the egg. Then if the light is cut off in the same way when the box comes up against your face, you will have a little "dark room." With this instrument you can tell whether a white egg shell has the germ started in 48 hours. In 72 hours, three days, you can tell very plainly. Point your egg tester right towards the sun; or, if after night, hold the egg near a strong lamp or electric light.

Use For Tomato Cans

Tomato, or other quart cans can be made to do service in the poultry yards. After one end is cut out to get the contents, take a pair of tin shears and cut a half moon down the side. Make the edge dull with hammering it over a little, then make a nail hole and hang up on side of house, or feed boxes. They do very well to put grit or other things in, such as bone, etc., for small yards. Or if you ship fowls either to market or to customers, they are better than whole cans for watering in. Usually a male bird is a little

afraid of putting his head in a deep can, but he will always drink from one that is wider than it is deep. Besides, express men do not, as a rule, fill such cans when they water stock, so that the cut cans are better in many ways. If you have a sick chicken these cans come in handy, because they can be thrown away after using if the disease was contagious.

A Simple Food Hopper for Chicks

This is a very simple hopper that hens can eat from on both sides. One half the top is hinged, so that it can be raised to put feed in or to clean out the hopper, the other side of top is fastened down. The hopper is 8 feet long and 8 inches wide. The ends are solid. The side board is 4 inches wide. A strip projecting ½ inch is nailed on top of the side boards to prevent the chicks pulling the feed out and wasting. The upright slats are 3 inches apart and common laths will do, though 2-inch battens are better. The hopper may be set on a 2x4, 2 feet long, one at each end, nailed across the hopper to prevent it turning over, as it might do, being so narrow. The height between the bottom part and top of the hopper, or the feeding space, should be from 6 to 8 inches, and the covers should have a good pitch, like a house roof, to keep chicks from climbing up on it. If it extends out a little way so much the better, as then it shelters chicks from the sun.

A Home Built Hopper For Hens

Cut out two boards for the sloping sides. These may be either redwood or pine, four inches wide at the bottom, ten inches wide at the top, and 20 inches high. These are triangular in front. The front board is 15x18 inches and the back board is 15x20. Two boards 5x8 inches tacked on at the bottom keep the grain in at the side. A board 15x5 inches closes the front feed box and one 15 x 2 inches should be tacked on to prevent the feed from being wasted. Care must be taken that the angle of the two sides is not too sharp, or the hopper may get top-heavy when filled with grain. The bottom of the hopper should be 15x12. This will tend to make it stable on its feet. The front upright board should lack 2 or 3 inches of going to the bottom to give a force for the feed. Make the cover several inches wider and longer than the hopper to keep the feed dry.

A Hopper That Holds A Hundred Pound Sack of Feed.

This is a serviceable hopper. It holds one hundred pounds of mash or grain and this should last sixty hens a week.

To make. Take a common redwood board 2 inches wide for bottom and ends, saw a piece two feet long for the bottom, and two

pieces three feet long for the ends. Nail these together, ends in bottom. For back and front use tongue and groove lumber, as it stands weather better. To put in your back, fit the first board inside of the ends, letting it come on bottom in center of hopper, putting the rest of back boards even with the outside. Put the rest of boards on outside. This lets your feed come out in front. Now put a four-inch strip across front at bottom. This prevents hens throwing out the grain. The cover should reach out at least one foot so as to protect the feed and the hens while eating, and should be made of water-proof material.

A Good Beef Scrap Hopper

This hopper can be made on the same plan as the other, only smaller and make the throat 1½ inches instead of one inch, because beef scrap does not feed as easily as grain or dry mash. You can also make a three department hopper of this by giving it a two-inch throat. This will feed oyster shell, beef scrap and grit.

Another Home-Made Hopper

This is suitable for indoors or in dry weather outdoors and it costs nothing. Get a box at the grocery store, say fifteen inches long, five inches wide and 10 to 12 inches high. Now board this box up tight, only leaving a 3-inch opening across the entire front of the box near the top. Fill the box with beef scrap and hang it up by a nail and the hens can eat it empty and no bother about clogging or other fuss.

The two hoppers mentioned above will need a cover that reaches at least 8 to 10 inches over the front where the chickens feed. As the hopper only feeds from one side the cover should hinge at the back and the hopper set against the wall. The cover being made of tongue and groove boards, similar to the back and front, will protect the feed in rain storms and also the hens while eating, if brought out wide enough. Beef scrap, too, must be covered, hence the hopper will need one unless put indoors.

CHAPTER XVI

RAISING BROILERS

The raising of broilers at a profit, unless you feed your own laying stock, is almost impossible. The three great drawbacks being infertile eggs, diarrhoea, and chicks with not enough vitality to stand forcing. All three of these faults will be dealt with in the chapter on "How to Feed the Breeders." We often hear the stock condemned for all these troubles, but it is not the stock that needs the blame, but the feeder. Nearly all a poultryman's troubles can be traced to the feeding. And that ought to make us more careful, but the fact is, that people will persist in doing things even when they know they are losing by it. But all this belongs to another place and right here is the place to talk about raising broilers.

The chicks that are intended for broilers will be all the better for a good long fast before feeding at all. Instead of 48 hours keep them 72 hours in the incubator without food or water. This cleans up every particle of the yolk that the chicks have to live on during these first hours of life. The digestive tract is empty and now ready to absorb whatever food is carried to them.

There are two plans of feeding broilers and choice of plan depends somewhat on the time the chicks are hatched, and on the demands of the market they are intended for. What I call the rapid plan will put the chicks on the market as early broilers but at the price of quality, for the meat is never quite as good. The slow plan takes a little longer but the meat has a better flavor.

The Slow Plan

We will take the slow plan first. The chicks can be treated as if intended for layers and breeders for one month. That is they can be allowed ample exercise, indoor and out and given moderate feeding. At the end of a month, if they commenced with a 72-hour fast, they have built up strong gizzards and good strong digestion, so that they can assimilate a lot of feed without being laid out with diarrhoea. This is most important, for unless you have a strong bony structure that will hold meat, and unless the digestive tract can assimilate the food, you can't raise profitable broilers.

At the end of a month you can select the pullets from the cockerels, if you wish, and they have had the very best treament towards making

good breeders and layers. Then you can commence to put the flesh on the cockerels.

Now chicks with such a start can stand a lot of spoiling in the way of food, and in putting broilers in shape for market, most of the food must be mashes. Vary the kind every day and feed only what they will eat up in fifteen minutes. All kinds of waste vegetables can be used in making these mashes, but care must be taken that they are not too sticky. Never leave them before the chickens to sour, as that would rob the chicks of appetite and cause diarrhoea. Ground oats, barley meal, wheat bran, middlings and ground corn can be used to fill up any or all of the mashes, but it is better to use just one or two at one time and change off. Always add a little salt, some charcoal and beef scrap in the mashes. By mixing these ingredients in the dry mash stuff before adding water, you get them more evenly distributed.

A dish or sour milk once in a while will help keep up the appetite, so if at all handy, serve it.

Green feed galore can be served and that will keep up both appetite and health. The animal food should be increased with the age and size of the chicks.

When yellow legs and skin are desired, put ten per cent of cotton seed meal in the mash, more than that will make the mash sticky.

For milk-fed chickens, which bring the best price in the market where they appreciate good things, the feed should all be mixed with sour milk or buttermilk. This is usually made the consistency of porridge and then the fowls are not given any water to drink. Sweet skim milk does just as well if it can be procured and if a little care is taken, the appetite can be held for three weeks, but that would be the limit. Fowls fed after this manner are usually in good condition to start with and this is the best way to finish them. They are fed in troughs and are given no exercise, so that the meat is soft and tender with a delicious flavor that nothing else but milk can impart.

During the last week of fattening milk-fed poultry add a tablespoonful of melted tallow for each chicken to be fed. Do this twice a day and you will have the very best of milk-fed poultry. The troughs and all feeding utensils must be kept strictly clean, and the chickens kept in slatted pens so that all droppings fall down below on the ground and the chickens are clean and wholesome. Too much cannot be said about cleanliness in this matter, for filthy feed troughs soon rob even a chicken of its appetite, and when the appetite fails, the birds may as well be killed as they will not put on any more flesh.

Broilers that have been raised four weeks as breeders or layers should be raised, and four weeks with less exercise and plenty of green feed and dry food are in prime condition and about the right age for making milk-fed chickens. They will also stand the cramming

that is necessary in order to get them in condition. To have them about three months old when ready for the table, there has been no feed lost, no time spent in useless feeding and your runs can soon be ready for the next lot.

The Rapid Plan

To use this plan it is absolutely necessary to start with good strong chicks that have been starved 72 hours after leaving the incubator.

Being sure on this part, start in and feed them every 2 hours. Commence at six o'clock in the morning and feed every two hours until you have given them seven feeds. Don't overfeed the first ten days, because if you do the chicks will get stalled and go back on their feed. The last feed in the evening may be the one exception, for then they should have all they can eat of chick food. During these first ten days the food should consist of something easy to digest, such as stale bakers' bread soaked in milk, rolled oats partly cooked but not pasty. Green food ad libitum, cooked vegetables, cooked rice and even a little dry bran, but the cooked foods must predominate. A boiled liver and some vegetables cooked in the water, then pin head oats mixed in last and just let steam a little, the liver being chopped all through the feed, makes a great dish for them. Animal food is one thing a chicken rarely stalls on.

By this method of feeding it is possible to make a broiler plant pay a good profit. Where the hens are not stimulated to heavy egg production there will be no diarrhoea, unless the brooding is wrong, no leg weakness and very few chicks dying.

To succeed with broilers the parent stock must be strong enough to give the chicks vitality to overcome these things. I have known cases where the chicks lived ten days and then commenced to die like flies. When the parent stock has been fed on too much starchy foods, it reacts worse on the chicks than too much meat diet, that is, there are always more losses.

CHAPTER XVII

FEEDING FOR EGGS

We have discussed getting eggs for hatching purposes, so that in at least the second generation we would have stock that would be so full of the vital spark they would not only live but that they would have enough of that vitality to transmit to the progeny.

That is the foundation to build on, and anything less than perfectly healthy, vigorous fowls are not fit to breed from. Breeding from sickly stock is like building a house on sand without a foundation.

In this chapter we are going to talk about eggs for commercial purposes and how to get them both winter and summer, always providing you have the foundation to work on. For you can't make sickly hens lay eggs of any kind in quantities to pay. You may force them a little with stimulants, but if the vigor is not there, they soon give out. So we are presuming that you have the foundation built and are all ready for business.

Commence your day's feeding with a light meal of either wheat, or barley that has been soaked and processed for one or two days, according to weather. Just at present, barley is much cheaper than wheat, and the poultryman who expects to make money with chickens must look twice at the price of a grain he is about to buy. The next item of interest to him is, will the cheaper feed serve the purpose he wants it for, will it bring eggs? If it will do this it is cheaper than the other both ways. Barley does bring eggs if fed right, it is a strong food and hens do not relish it quite as well as they do wheat, but we don't need to consult a hen's taste, only her needs and barley fills her needs for an egg ration.

Now about nine o'clock, give the hens their green feed or processed oats if you have them and if feeding dry mash, of course the hoppers should be opened up, so that the hens can help themselves. At noon, if you do not feed dry mash, give a fairly good feed of moist mash,

Even if you do feed dry mash a small feed of moist mash will be very acceptable to the hens about noon; hens seem to relish it. If you have sour milk with which to mix the mash you will get better results.

If the hens have dry mash before them, they will need no further feed until the last meal, which should be of good sound grain, unless you are well supplied with green feed, in which case give them some

POULTRY IN AN ORCHARD, COLONY HOUSES IN THE BACKGROUND

to pick at, or a few roots such as mangel wurzel or other beets, or a cabbage head. Plenty of succulent feed pays a big dividend in eggs.

Besides the feed, hens should be well supplied with grit, oyster shell and bone. Bone is one of the most important factors in getting commercial eggs; there is plenty of lime in bone and this in a form most acceptable to a hen's anatomy. It can be supplied in the mash, but if not supplied in this manner, then it must be kept where the hens can help themselves.

If labor is not considered, there is not anything on this green earth that pays better in eggs than sprouted oats. But it is a chore to furnish a big flock of hens with enough sprouted oats to count. I have been feeding sprouted oats for over ten years, so know what I am saying, but as stated, it is a big chore. Oats to a hen is what oats is to a horse. It is life and vitality.

All horses that are to be depended upon in times of stress are fed on oats, which gives strength and fleetness to the race horse and they will give strength and endurance to your hens to keep on laying all the year around.

Two feeds a day of sprouted oats will give you eggs in winter, when nothing else will. I am speaking now in general, but I am going to tell you how to feed each breed or rather each class of poultry separately.

There are a great many mistakes made by feeding all alike. It does not pay, because their needs are not all alike.

Different Breeds Require Different Treatment.—All the small active breeds can stand a little more of the fattening foods, such as corn, than the heavy breeds. They do not put on so much flesh, so in place of the barley or wheat, cracked corn or Egyptian corn can be served for the morning meal, or if preferred, for supper, especially in winter when eggs are wanted for hatching.

But for the large breeds no corn should ever be fed, as they get too fat internally. Make them scratch for the most of their living and you will have strong, healthy hens and chicks.

CHAPTER XVIII

BALANCED RATIONS, WHAT ARE THEY?

In the last chapter it was stated that there are many mistakes made by feeding all alike, because their needs are not all alike.

The reason all breeds of fowls need different treatment in feeding is one of temperament. The active breeds can digest more food without injury to themselves than the heavy breeds. So if you feed any of the small breeds corn in the ration they can use it to good advantage in building up the tissues of the body that are used up in activity, while foraging around almost aimlessly. If you feed corn to the large breeds that are content to stay where they are put and spend no energy in rambling around, they use the corn to lay on more fat and flesh. Corn is a flesh and fat builder and in balancing a ration for the different breeds we have to keep in mind what each article of food is used for. Or rather what use the hen will put it to, according to her build.

What Is Protein?—Protein is the name given to all nutritive substances that contain nitrogen. It is a general name because protein includes albuminoids, and these are found in the white of egg, in milk, in the blood, etc.; casein (the curd) of milk; myosin, the basis of lean meats, and muscle and the gluten of grains. More than that it includes such things as a gelatine obtained from hoofs, gristle, bones, extracts of all animal matter, fish and other things too numerous to mention.

What are Carbohydrates?—These are the starches obtainable from grains, vegetables, the livers of animals, the sugars that are found in all grains, fruits, milk and a cellulose from the fibre of plants.

What Fats Are.—The fats include all grease from animal flesh, fat of milk, fats of vegetable oils, yolks of eggs, and that which is found in all grains and vegetables.

What Are Minerals?—All grains, all vegetables, and one may say, all animals, contain mineral substances in more or less quantities. It is chiefly the mineral substance in the ground that all plants feed on; the vegetable lives on the mineral. Therefore all foods contain some minerals, but bones contain very little else. Please remember that minerals are classed as phosphates of calcium, sodium, magnesium, etc., and every living thing contains them.

What of These Substances in the Feeding of Hens?—The office of protein is to build bone, muscle, tissue, hair or feathers, and is necessary to keep the animal body in repair. It renews and keeps up the animal organism.

The office of carbohydrates is to maintain the heat of the body, maintaining motive energy, and any excess over the **needs of the body is converted into fat.**

Fats also maintain the heat of the body and furnish motive energy; if a fowl be, at any time, kept without food the fat furnishes what is required in heat and motive power until all the extra fat and flesh is gone, then death steps in.

The vegetable proteins never fill the place of the animal protein, both are necessary and both fill the wants of an animal organism to produce results.

Ordinary foods rarely contain sufficient mineral substances for hens that are laying eggs, hence we must provide for the shell. Minerals supply the material for shell making, feather making, and the egg itself must contain mineral or the embryo could never develop into a chick. In the growing chick, it is necessary for the growth of both bone and feathers and it must be in that form that is the easiest to assimilate, in order that the chick make quick growth. Bone, in any form, oyster shell, grit and even good coarse sand furnish free mineral substance and if given plenty of these, neither hens nor chicks will ever suffer for want of minerals.

What a Balanced Ration Is.—A balanced ration is one where the protein contents have a certain definite amount as compared with another certain definite amount of carbohydrates, fats and minerals. It is the effort of man to regulate the needs of nature. A balanced ration, to be of any account must be compounded from a list of animal foods, grain foods, vegetable and mineral, in such proportions as to act as substitutes for bugs, worms, seeds, grasses, and pebbles the fowls would find if at liberty.

The Processes of Digestion.—The processes of digestion are chemical in action, or rather, they are reactions. Hence so much of one substance is always required to make a change in another substance. To illustrate, it requires fat and lye to make soap, just those two ingredients, but more than that, it takes so much fat and so much lye, or the fat will not mix and we still have, in part at least, the two separate articles, fat and lye; the chemical reaction does not completely occur until the right amounts are mixed. In a similar way, the digestive ferments can only fully act when the food is mixed in right proportions. Concentrated foods, like protein, if given alone, would pass out of the system unused, in part, and must be mixed with other food of a bulky nature so that the digestive ferment can operate on the whole.

Cooking Vegetables.—When vegetables are cooked and fed to hens the digestibility is increased, but the sugar escapes in the water. Now if the water is used to mix up a mash in which the contents are protein, carbohydrates and fats, the sugar from the water is impregnating the whole mash, and while the sugar is almost immediately absorbed into the system, it has started the action of the others and each will be taken up in turn to use for either egg making or flesh.

Feeding the Different Breeds

And now we come to that one point where so many people make mistakes in feeding. The large breeds, such as Orpingtons, Rocks, Wyandottes, Rhode Island Reds, Langshans and Cochins, are all of quiet, contented dispositions, satisfied to remain inside a very low fence. It never worries them to be fenced in at all, they eat what you give them and make the best possible use of the same. Therefore, to feed them a lot of food that furnishes motive power, is waste. They are so well feathered that winter weather, even down to zero, would not send them to hunt cover, and certainly no rain storm. When the small fowls are huddling up in corners out of rain or wind, these others are quite comfortable and shelling out eggs. So they do not require so much heat-making food and if it is given to them, as in the case with the other food, they make the best of it, some that are of good laying type, will use it for eggs, others use what they can for flesh, and much of it passes away as ash.

On the other hand, the Leghorns, Anconas, Minorcas, Andalusians, and all breeds of light weight require more food of a starchy nature, because they are more active. They require more heating foods because the body is smaller and does not generate heat sufficient to withstand cold or wet weather, neither are they so heavily feathered, and all these things must be taken into consideration in feeding.

CHAPTER XIX

FEEDING THE BREEDERS

This is the most important chapter in the book for those who produce eggs for hatching whether for themselves or hatcheries. And right here I am going to make a very radical statement, and that is "that you can't hatch chicks that will amount to anything from stock that has been stimulated by a too stimulating diet for more than one generation."

It can't be done, because their vital organs have been so overworked that they have no vitality to put into the egg. What is not in the parent stock cannot be transmitted to the offspring. The feeding, then, of the breeding stock, should be considered more than it is, but the facts are, people only consider the quantity of eggs they can get, and quality remains an unknown feature of poultry raising. But in the end the price has to be paid in losses, so it is far better to learn in time.

Now the question is: What are the stimulants for poultry, and what constitutes a stimulating diet?

First among stimulants are drugs, condition powders, poultry mustard, Cayenne pepper, etc. Some of these are sometimes useful in cases of sick fowls, in fact everybody uses such things in times of need, so that even drugs have a place in poultry culture, but their place is not in the feeding or dosing of breeders. If breeding poultry are not in fit condition to breed, make them so by removing the unfit and feeding the best on good sound grain and vegetables.

Second, and now we come to the ration proper, of fowls. Drugs are neither food nor drink, therefore not to be classed as a diet or ration. The greatest stimulant we have in the food line is green bone, or fresh ground bone as it comes from the butcher. If this is fed to breeders, it must be in very small quantities, say one-quarter ounce to each hen and only two or three times a week. The next is beef scrap, in fact all kinds of animal food act more or less as a stimulant to poultry, and yet some is necessary to keep them in a natural healthy condition. So it is not with the animal food itself that we find the harm, but in the quantity that is fed to produce eggs. A little ground bone, or meat of any kind is all right and may be called a proper article of diet, but when you feed more than a hen would be likely to get under natural conditions, then it is harmful.

And now the third and most dangerous stimulant, I say dangerous because it is generally considered so harmless, is mash. I don't care

whether it be dry or moist mash, if it is fed in quantity to breeding hens it is harmful to the chicks that are hatched from the eggs. It will produce eggs, yes, and eggs that will hatch, but if fed in such quantities as to over-stimulate the egg organs, the chicks will be hard to raise, many of them will die, no matter what care is given them, and nearly all of them will have some form of diarrhoea.

Having gone so far, it is now my place to go farther and tell you what constitutes a proper ration for breeders, that will not prove harmful to hens or chicks, nor unprofitable to the breeder.

Hens must be treated as you would other animals, that is as near to a natural condition as is possible for us to go without losing out. That is our part of the deal, to watch the financial end. And I claim that if we take care of the quality of the eggs the breeders lay, that the financial part will adjust itself.

How much profit can we make by hatching one hundred chicks and only raising fifty of the one hundred? We have taken up the room in the incubator that might have been used to hatch good chicks; we have spent some of our own time turning eggs that could have been spent in better and more profitable ways; we have used up oil that costs money, vegetable feed that could have been used other ways besides energy and patience galore to hatch fifty chicks that would not, or could not live, no matter what you did for them because the vital spark was too weak. I learned the lesson many years ago and have done my best to tell others, but the method of mash feeding is too alluring to give up after once getting started with, so each one has to learn from experience.

A short time ago a Pomona poultry man came to ask me what was the trouble with his chicks, he said the first hatching did finely, then they commenced to die like flies and yet he gave them the same care and everything that was possible, yet he could not raise them. I told him the trouble was in his feeding system and that during the early spring, when he got his first lot of eggs, the hens had been having a rest and were in better condition than later, so that the chicks inherited a little more of the parent energy.

He said, "I believe you have the right idea, but why don't you say more about it in the journals?"

I have said it more than once, but few people want to wait long enough to get results, mash feeding brings quick results and that is why it holds favor. They look at the present and forget the future.

My Method of Feeding.—This is no get-rich-quick scheme, but it will give you fertile eggs from which you can raise, with proper care, at least 95 per cent of the chicks hatched and the difference between 95 per cent and 50 per cent is quite large, so that it ought to make you some money, if not make you rich.

In the morning, feed a light feed of barley that has been soaked and dried off, or wheat, say a quart to fifty hens in deep litter. Make them scratch for this early meal, scratching starts the blood to circulate and makes the hens warm up to business. If the weather is cold, water them with fresh water either drawn from the well or from the hydrant. Water is always warmer when fresh than if it stands in the drinking vessels all night.

At about nine A. M., give them a feed of sprouted oats, all they will eat, and at one o'clock give a little dry bone in the litter or three times a week a feed of beef scrap or fresh ground bone.

At three o'clock another feed of sprouted oats or barley, and for the evening meal as much wheat in the litter as they will scratch for, they won't want very much.

If there are any roots or vegetables give some of them to the hens, only don't feed anything of too watery a nature. To vary things, if you can not get bone feed, a little moist mash at noon made in a crumbly state, not wet, and feed just a little for each hen, not enough to gorge her.

This is no starve-out system but a natural, healthy system of feeding without stimulating any organ in the hen's body.

By this method of feeding it is possible to nourish the hen's body so that what eggs are laid will have a positive potential energy, to furnish the chick with a working base for life.

The egg organs of a hen that has been stimulated for heavy egg production by lots of meat, mash and poultry condiments are under the microscrope seen to be in an inflamed condition.

Healthy organs are always of a pinkish color; when that changes to red, there is always more or less inflammation present. And when eggs for hatching are produced under such conditions the chicks inherit this tendency to inflammatory diseases. They may break out in various ways, provided they live to maturity; some will have rheumatism, others diarrhoea, and some may be all right apparently, but have very little stamina.

But a good wholesome method of feeding will bring them back so that the second generation will be strong and healthy fowls. This could not be done if fowls were very long lived because it would take much longer to undo the mischief.

Government Work For Poultry Industry

During the past few years the Government has done some very good work for poultrymen. When experiments are made by the individual it always carries a bigger loss than the average man can afford. Then again, the tests fail to satisfy many people who are so built that they can only believe that which is given by authority.

Several years ago I experimented along the lines given below, which are taken from Bulletin No. 145, by Horace Atwood, and issued by the West Virginia Experiment Station. The bulletin is entitled "Some Facts Affecting the Weight, Composition and Hatching of Hens' Eggs." The author says:

"The feeding of green feed had no effect on the size of the eggs produced, as was shown by the experiments reaching over a period of an entire year. Throughout the year the average weight per hundred eggs was 11.89 pounds for fowls receiving green food, as compared with an average of 11.88 pounds for fowls that did not receive any green food. At the conclusion of the test the eggs laid by the pen without green food averaged larger than those of the other pen. But, and here is the point, the pen receiving green food made an increase in production of 26 per cent. And yet there are poultrymen so foolish as to neglect this one great means of increasing egg production and lessening the food bills at one and the same time.

"Liberal feeding noticeably increased the weight of eggs produced and also the percentage of fertility. As was to be expected, liberal feeding resulted in much larger production than when the hens were scantily fed. It may seem to some that there is no occasion, at this late date, for demonstrating or discussing such an elementary point, but as a matter of fact a large proportion of those who keep fowls especially on the farms, are still of the opinion that it pays to half starve hens, so that they will forage and collect a considerable portion of their food on the range. I doubt if any flock handled in this way, even on the farm, ever gives as profitable results as they would with more liberal feeding. As this bulletin points out, heavy feeding increases the size of the eggs as well as the number.

The fertility of eggs in the scantily fed pens was found to be low, but the eggs that were fertile hatched practically as well as a similar number of fertile eggs from the heavy fed pens, and in all the tests made the per cent of losses of chicks from the scantily fed pens were smaller.

There was greater uniformity throughout the season in the percentage of the scantily fed pen. Hens on a full ration lose heavily in fertility as the season advances because of their inability to maintain their vigor indefinitely. The only practical means of keeping up the vigor of the breeding stock through a long hatching season is to restrict production to what may be called the natural physiological limit.

This scientific test bears out what I have told you in another chapter of this book, on feeding the breeders. Hens that are stimulated past what they would lay under fair, natural conditions do not endow the progeny with enough vigor to make much of a fight for life. At the first little hardship, or change of climatic conditions, they go under, and are only to be counted as "has beens." I have

seen chicks die like flies, even when every condition that one would expect them to need was filled, simply because the parent stock had been over fed and stimulated to lay eggs, regardless of what happened to the chicks that were hatched from them.

Any breeder who will believe and act on this for just one hatch will be more than convinced that this is the truth, and if he is honest with himself he will never overfeed his breeders again. If he is selling eggs to others, he should not aim to sell cheaper than the other fellow, because he will lose out if he does. But charge according to quality, and if people prefer to pay for chicks that may or may not live, why the breeder who sells what he knows will live, can better hatch his own and sell at three months old.

There is so much to be learned about feeding that no wonder busy people don't learn it, even in a life time, but we all need to learn enough to get a good working basis for present conditions.

CHAPTER XX

FATTENING AND PREPARING FOWLS FOR MARKET

It is not uncommon to hear people say they have some poultry ready for table purposes, and they are sold for that purpose, when they are but just in good condition. There is a good deal of difference between being in good condition and being finished, or prepared for market.

Before fowls are really fit to sell for table fowls, they must be confined to a limited space where exercise is limited. Then, again, there must be a proper food; if we only want to fatten them that is easily done with corn, as corn will fatten anything. But if we want to get flavor and quality with the weight it is necessary to go to a little more trouble than throwing down some corn.

First of all, the chickens must be cooped up, it matters little what kind of a coop is used so that it can be cleaned and so that the birds can be fed from the outside. This is the most important feature, the keeping of the chickens out of the feed they are to be finished on. After cooping it is best to just give water and feed very light for a few days. Get them hungry in the start and never spoil their appetites by feeding too much. That is the whole secret of putting flesh on cooped chickens, no matter what age or anything about it.

Sour milk or buttermilk if it can be had at reasonable prices will pay a good dividend, not only as a flesh maker but it keeps the chicken toned up to its appetite.

Among the foods that are best known are ground barley, ground oats (these do better if the hull can be taken out); good wheat middlings and cornmeal or ground corn and bran. It is not really necessary to feed all of these at one time, but take one as a base and add any one or more to it and feed for that day. Pea meal is a very old fattening diet that makes good meat, but ours is not a pea-growing country, so our fowls are not likely to get it. If bean meal can be had, this is a great addition to the list. The fowls being cooped and starved until ready to eat anything, should be fed, sparingly at first, of feed mixed about as thick as batter and mixed with either water or milk as it can be got. After the fowls have eaten, the troughs should be taken away and washed, put in the sun to dry and left until the next feeding time. Three times a day is considered about right and at each feeding the fowls must be left just so that they could eat a little more. If they once get stalled, it is hard to get them back. Feed all the green feed they will eat about twice a day

and keep other fowls away from them. If they can be put in a semi-darkened place so much the better as they will put on flesh more rapidly.

Three weeks is considered as long as it pays to keep them up, and they should be in good flesh to begin with. During the last week put in every feeding about a tablespoonful of tallow to every bird, a little salt added to the feed makes it more palatable. Some do not give any water, considering the thin feed sufficiently moist to serve, but I always give water to drink and have not noticed any bad results.

At any time when the feed is not cleaned up as it should be, it must be kept from them one meal at least, two if necessary.

The pens must be kept sweet and clean; if the weather is hot, add a little carbolic acid to the water the coops and troughs are washed in, as this keeps them sweet better than anything else.

It pays better, of course, to get private customers for fowls that have been fattened and prepared like this, but if you have to sell on open market or to commission men, it pays, because once they have bought your birds they will know what to expect and the price will be raised the next time and they will want more.

This is always more satisfactory than if a person has to beg a market, especially if the market happens to be overdone with the same size of birds you have to ship.

If the birds are for private trade, they should be kept without food and water for at least twenty-four hours before killing. They are much easier to clean and will keep better when this is done than if the birds are fed the last day.

Killing.—Have an old case knife ground down on both sides until it resembles a sharp pointed spear, and is not over a half inch broad. About two or three inches long is right. Now, when ready to kill, have the knife sharp and kill the bird by sticking the point of the knife in the roof of the bird's mouth, giving it a twist after it enters the brain. This is the cleanest and quickest method of killing.

CHAPTER XXI

BALANCED RATION FOR HEAVY BREEDS

It must be understood that in balanced rations, green feed, grit, charcoal and all condiments are left out, being outside the term of a "balanced ration."

The day's ration should commence with a feed of grain, in deep litter to induce exercise. The grain may be either wheat, oats or soaked barley, or it may be a little of all three, but never corn. About nine o'clock feed some form of green feed, and if you are just selling eggs for commercial purposes, feed a small amount of moist mash about noon. The mash must contain one to four to be equally balanced. That is if you have a quart measure you fill it once with animal food, such as beef scrap, fish meal or meat meal, and four times with the carbo-hydrates.

This is not scientifically correct, but it is as near as we can get it without the different food values being analyzed by experts. Sometimes bran is lacking in protein and an expert would make it balance with something else, and this, of course, cannot be done with crude measurements. The "quart" is used because it is the smallest measure used for ordinary purposes and it can be multiplied as many times as is necessary.

The following mash is as good as can be made for all breeds of fowls that are likely to put on flesh. It is not so much the mash itself that causes troubles, but the quantity that is fed. For this reason do not allow more than one good handful for each hen of moist mash and a little more of dry, for one day's feeding.

Wheat bran, 200 pounds; ground barley, 50 pounds; ground oats, 50 pounds; alfalfa meal, 50 pounds; ground bone, 25 pounds; salt, 5 pounds; charcoal, 5 pounds; beef scrap, 25 pounds; fish meal, 40 pounds. Bone meal or ground bone does not contain quite as high a protein as beef scrap or fish meal, so there is a little allowance made for that and the protein contents appear to be a little higher than they really are.

A good mash for all light breeds such as Leghorns, Anconas, etc.: Wheat bran, 200 pounds; cornmeal, 100 pounds; wheat middlings, 100 pounds; ground oats, 50 pounds; ground barley, 50 pounds; ground bone, 25 pounds; beef scrap, 50 pounds; fish meal, 50 pounds; charcoal, 5 pounds; salt, 5 pounds; alfalfa meal, 50 pounds; soy meal, 25 pounds. The alfalfa meal is optional and can be either given or not according to whether the hens have plenty of green feed or

not. It has nothing to do with the balanced ration, but if hens do not get enough green feed it is helpful to increase the vegetable protein.

Another thing, the barley meal can be increased to take the place of cornmeal with good results even with Leghorns. Barley is a strong food and will answer every purpose, when ground, that corn will, except that it works a little slower in fattening.

This mash may be fed in a hopper and kept before Leghorns at all times, and will give good satisfaction. Other grains can be substituted for those mentioned, always keeping as near to the ration as possible. Soy bean meal is a very rich vegetable protein that helps eggs to come but is a little too fattening for the large breeds.

Cook up all the waste vegetables and wet the mash up with the same liquor the vegetables are boiled in. Beans are about the only thing chickens do not like and I never yet saw any that would eat beans freely.

A change of food is always desirable, but it must be made gradual or it may upset the fowl's digestion. "Go slow" is a good motto in many respects, especially dealing with poultry.

CHAPTER XXII

THE MOLD THAT INJURES POULTRY

For some time we have fought shy of feeding any kind of food that was affected with mold; and have been on the lookout for information concerning it. That it causes bowel trouble, nearly every one who handles chickens will admit, but we find among other things, it is accredited with many other diseases, that are usually laid to other causes.

Dr. Cushing was one of the first writers to discover that moldy straw was a frequent cause of white diarrhoea in chicks. He told how moldy straw was found in the crops of the chicks, and how the mold spread through the system and developed characteristic nodules in certain organs.

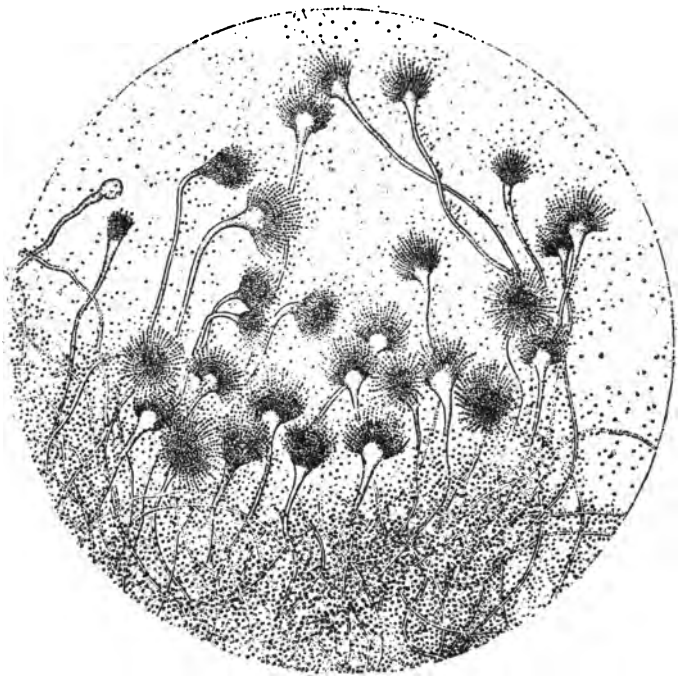
And now comes another man in Trinidad that has established the fact that this mold has been the cause of an epidemic in "chicken pox." This, he claims, is from feeding moldy grain.

A study of this mold with the scientific name of Aspergillus Fumigatus, proves it to be the same mold that appears on bread. Dr. Charles F. Briscoe, the instructor in Bacteriology at the University of Illinois, kindly gave this information about the mold in question: "Origin—white bread; in the air passages and lungs of birds; also in man. Color—a greenish or bluish gray growth. Fruit Organs—The club-shaped ends of the fruit hyphae are covered with sterigmae from which extend rows of spores that are usually colorless. The growth is best on bread and is rapid. Pathegenesis—Intravenous injection of millions of spores in rabbits and dogs produced death in a few days. Mycelia—Were found in the kidneys, heart and other muscles and occasionally in the liver. Infection of doves and other birds by inhalation of the spores produced a pneumonic or pseudo-tuberculous disease. Natural affections of this kind are frequently observed among birds. Occasionally they are met with in cattle and horses, and at times in man."

In mycoses of man, the lungs, ears, eyes and nose are subject to invasion.

In 1897 Renon found that this mold developed on eggs during incubation, and that it may contaminate the embryos contained therein.

The most important treatise on this subject is contained in Bulletin No. 58 of the United States Bureau of Animal Industry, Pul-



Aspergillus Fumigatus, the mold that kills poultry.

monary Mycosis of Birds, and anyone who wishes more information on this matter can obtain this bulletin by writing the Secretary of Agriculture, Washington, D. C.

Readers will now see why I always advocate washing out both incubator and brooder with a dilute solution of creolin. That it kills mold spores I know. I also suggest that a teaspoonful of creolin be put in the moisture pans so that the mold cannot develop during incubation. Warmth and moisture breed it. A good supply of garden soil should be used for bedding brooders and brooder houses. It is important to refuse all moldy grain and straw, no matter how cheap they appear to be, they are dear as a gift. It is also said that many perons who work in flour mills and are supposed to have tubercular disease, have really aspergillosis, or a disease caused by this mold from eating moldy grain and living where the spores are present.

CHAPTER XXIII

EGG FOODS, OR CONDITION POWDERS

Recognizing that some of our readers may want to make their own condition powders or egg makers, I will give a few that are as good as the best.

The base of all good condition powders for either animals or poultry is flax seed meal, either in its raw state (pure) or after having the oil taken out. It is then called "processed" and in my estimation cannot amount to very much in food values. Venetian red, so-called, is, properly speaking, red iron oxide, and will bring eggs, of that there is no doubt, but it has some injurious effect on hens, because after being fed to them they never lay as well again without it, hence it must be very stimulative.

Condition Powder No. 1

Capsicum	1 pound
Iron sulphate, powdered	1 pound
Magnesium oxide	1 pound
Venetian red	1 pound
Sodium bi-carbonate	1 pound
Sulphur	1 pound
Powdered chalk	2 pounds
Ground bone meal	2 pounds
Ground oyster shell	5 pounds
Charcoal	2 pounds
Table salt	2 pounds
Flax meal	10 pounds

Have all the ingredients in fine powder form and fresh and keep in tight cans. Mix two scant tablespoonfuls in moist mash enough for twenty hens.

Condition Powder No. 2

Fine ground mustard	5 pounds
Blood meal	10 pounds
Powdered Fenugreek	2 pounds
Saltpeter	4 ounces
Powdered gentian root	2 pounds
Ground ginger	4 ounces

General View of a Poultry Section in Petaluma District

Flower of sulphur	1 pound
Table salt	2 pounds
Charcoal	2 pounds
Fine ground oyster shell	10 pounds
Black Pepper	5 pounds
Flax meal	10 pounds

Mix all together and give one tablespoonful to a dozen hens in mash. The black pepper offsets the laxative qualities of the mustard and blood meal, besides it is carminative and warming without being too stimulating in effect.

CHAPTER XXIV

THE VALUE OF MILK IN THE POULTRY YARD

Poultry and ducks are carniverous in habit, and partly so by nature. They do not belong to the same class of carniverous animals as the dog, wolf, etc., but they must have animal food of some kind in order to do their best. More properly speaking, they are insect eaters, and ducks especially will not lay or thrive unless they are supplied with a substitute for insect life. Ground fresh bone is the nearest approach to insect life that we can furnish domesticated fowls. But not many of us are so situated that we can obtain fresh ground bone. Farmers are very rarely able to get it, living away from centers where such things are produced. Now the next best substitute is milk. Milk fills every requirement for poultry. The man who has a flock of laying hens and enough milk to serve them for drink is well off for a good supply of eggs. He can produce eggs a great deal cheaper than the man who must buy beef scrap or other animal food.

Not only will milk produce more eggs, but they will be of better quality. Good, sound grain and milk together with a reasonable amount of green food makes for a firmer yolk and a richer color. And it stands to reason that the eggs will have a better capacity for keeping longer than when the hens are fed on strong, highly flavored meat food. Milk being rich in lime is also a great factor in shell-making; this one item alone saves the hen's digestive organs, as she has egg and shell material right to hand with the smallest amount of labor.

For raising young chicks, there is no other form of animal food that will make the growth of bone and muscle more so than milk. It contains all the elements for feather, bone and muscle growth in a much easier way for the chicks to digest than meat and fish combined.

But it is in the fattening of all kinds of poultry that milk excels. The U. S. Department of Agriculture has made extensive experiments along this line, and in every case the use of milk in some form has proven the very best for producing poultry meat of fine flavor and quality.

Buttermilk and skim milk are the kinds most in use for fattening poultry, usually sour milk. The sour milk has a tendency to keep the appetite of the fowls sharp so that they are ready for every meal;

it is also easy of digestion so that all of its value is appropriated by the birds.

When a large number of birds are to be fed, the feed is mixed in a large tub or trough with a garden rake, to the consistency of thick cream, or so that it will drip from a spoon. In very hot weather it is advisable to mix the feed a little thinner than in cool weather. But if that does not satisfy the chickens, feed a meal or two of thick feed. This has to be left to the judgment of the feeder some, as he knows how the chickens are eating.

No water is given when this system of feeding is used—so it is necessary to watch the chickens' needs.

CHAPTER XXV

THE MANAGEMENT OF POULTRY DURING THE SUMMER

California differs from all other states in the Union in summer climate, and unless poultry is treated accordingly, it is not possible to get the best results. Very little corn must be fed to layers, and none to breeders. Old hens that are not intended to be kept over, should be separated and given a two or three weeks' course of fattening. During that time they will lay more eggs and put on flesh at the same time, unless they become broody. At the end of the fattening period, dispose of them, it makes more room for the young ones.

The question of profit in poultry is very much dependent on the management of the sales department. Nothing that does not pay its board bill and a little towards other expenses can be retained at a profit and it should never be kept through the molt.

Some poultrymen make a clean up every fall, but I find it pays best to get rid of the old hens before the molt commences. Go over them in June, then again in July and separate the hens according to age. After the last going over give the stock that is to make the winter layers more room, by opening gates and taking down a little wire. If the male birds have been removed and it is possible to turn the hens into a green pasture or kale plot this will be a real vacation for them. The older birds can be kept laying by feeding plenty of egg-making food and an additional amount of green feed, while those intended for breeders during the fall months should be given a rest and this can only be done by cutting down the feed. Give just enough to supply the bodily needs of the hen, nature always attends to that first, and it is the surplus feed the old dame uses for egg production.

Plenty of shade, good cool water and green feed with a light feed of grain morning and night will keep up the body and give all the organs a rest.

If there is no natural shade, in the way of trees, if you plant a row of sunflower seeds along the east and west sides of your poultry yards and keep them watered and the soil stirred during April and May, by June you will have splendid shade that the breeze can penetrate. There will be no panting for breath, no running in houses out of the sun, but the yards will be as cool and moist as in early spring.

It is surprising the effect shade has on laying hens, with a cooling diet and shade they do not seem to know that it is summer; there is

very little broodiness, as compared with hens that have no shade, and the eggs come merrily.

The young stock should be given all the range possible and a good growing feed kept where they can help themselves.

During the heat of the day, chicks do not want much to eat, but they like to be out early in the morning foraging, and late at night. It is a chick's delight to catch the insect life that ventures out after a warm day.

A few rows of kale plants will furnish both the forage and shade for a good bunch of chicks. The growing chicks will need a little meat, or milk is better if on hand; in fact, milk is the very best animal food for either old or young poultry at any and all seasons, and especially so during the summer season. Sour or clabbered milk furnishes bone-making elements in a free condition that is easy to digest; for the laying hens it furnishes animal food and lime for the egg shell, but to those hens we desire to rest it should not be fed too freely or they will go to laying more eggs.

To the hens that are to be disposed of before winter, animal food may be given, in order to get all out of them that is possible, but for stock that is to be kept over another year, whether yarded or on range it is better to feed very little concentrated food.

Ventilation.—Another important feature in summering fowls is to give plenty of ventilation in the houses. If it is desirable to face the houses north, as it is in this locality, the houses can be raised from the ground about four or six inches by placing blocks under each corner. The air can then circulate all around, and being under the perches no fear need be entertained of danger from draughts. Facing the houses to the north with underneath ventilation gives a cool house night and day; it also prevents mites from breeding under the sills of the houses, as they frequently do when the houses are set on the ground.

No Fast Rules.—As each locality has some little difference in climatic conditions, there can be no set rules for all alike and while we face our houses to the north some may do better to face them to the east, south or west, but which ever way they face, they must be well ventilated if the fowls are to do well and keep healthy.

It is well to remember in this connection that dark, damp places are the breeding place for mites, so let in the light. If your houses are closed up take out one end or side, even if you think you must replace it for winter. Barrels of air are necessary in our climate for all poultry and the old idea of night air being dangerous is done away with. When left to themselves the chickens will sleep in the trees with air all around them, and their combs are the indicators of good robust health. So let us be generous in the matter of air and give the fowls all that is good for them.

CHAPTER XXVI

THE MOLT IN CALIFORNIA

Many experienced poultrymen say that the molt is a perfectly natural process, uncontrollable as to season and duration of time. But with all due deference I disagree with them. The molt can be controlled in both ways, that is, as to season and duration.

For hens that I know are strong and up to the mark in age and vitality, I commence the molt by separating them from the rest and giving them a cool, shady place in which to chew the cud of yesterday. Plenty of water and air but little else for three days, then half of one regular feed once a day for the next three days and this is given at night.

About the sixth day, the feed is increased a little. About the seventh day, if the feathers appear loose the hens are either turned out or given more room and are fed all the succulent green feed they will eat. As they are pretty hungry by this time they will eat an enormous amount of green feed and this starts the feathers to loosen faster. And from this time on they are given plenty of green feed, and all other rations are increased. Animal food is demanded as a feather grower, bone and mineral. Plenty of grain, and this should be given in variety. In the morning, feed oats and wheat, at noon barley, in the evening wheat and barley or a little Egyptian corn, high protein and low carbo-hydrates and fats. Sprouted oats are one of the best feeds for molting hens as also is barley. Barley appears to be at its best after soaking about five hours and after being drained, left standing in bulk eighteen hours.

Some hens lay moderately during a part of the molt. None appear to lose any health or vigor, and unless the feathers are left lying around no one would know the hens were molting. The new feathers replace the old so orderly that the hens are never bare or ragged looking like some are. The males do not seem to get the new feathers as quickly as the hens, and sometimes it is necessary to help them by pulling the feathers from the head a few at a time.

What Are Carbo-hydrates?—Carbo-hydrates embrace all the by-products of the mill, all shorts, middlings, rolled oats, wheat bran, soy bean meal, etc., all roots that are grown under ground, such as potatoes, carrots, beets, parsnips, etc. If these vegetables are served raw, they are better for poultry than if cooked. Cooking breaks the cells and makes quite a chemical change in the food product.

Now, this is where so many people fail in getting a quick, even molt, they serve as much, if not more of the mash feed to the molting hens than to those that are not molting. This makes flesh but not feathers, and during the molt feathers are at a premium. Raw ground bone, if it can be had, can be served once a day to advantage, and also a little mash every other day will help, but the idea is not to crowd the system with carbo-hydrates. I do not mean to say that the hens should be deprived of them altogether, but that protein comes first and carbo-hydrates last. Sunflowers possess oil and minerals both and they can be fed in small quantities at first, increasing as the demand for new feathers increases. Green feed contains more mineral than any other form of feed, perhaps, except animal food, so the more green feed the chickens eat, the quicker will they get over the molt and be back to laying. The molt is, at least, a long, profitless period for the poultry raiser and if the unproductive period can be lessened it will surely be of great benefit to all.

It must be kept in mind that lice and mites are no aids to a quick molt. The hens must be kept clean and their roosting quarters be both clean and well ventilated. If these things are looked after your hens will be back to laying in sixty days without fail.

CHAPTER XXVII

THE GENERAL PURPOSE FOWL

There are several breeds of fowl that come up to the ideal in both eggs and meat, when we get the best specimens. These are what we mean by a general purpose fowl, a breed that will lay a fair average of good sized marketable eggs and when it is time for her to be sent to market will bring the cost of raising and caring back in meat.

This can not be done with the small breeds because the carcass will not weigh enough, nor will the public pay the top price for what they do weigh.

For an egg farm the small breeds are the favorites, and there are reasons for this that do not appear in print very often, because everyone seems to be afraid to speak what they think for fear of hurting someone else's feelings or some other foolish thing. Now, this is all nonsense, because there is no breed of chickens or animals in the world that is going to please everybody. We are all built on a little different plan, that is, our likes and dislikes are our own, just as much as our clothing or money is ours, and it is one of the greatest blessings of humanity that there are a variety of good things, some one of which suits every one of us.

After raising a great number of the different varieties of poultry, and thinking each variety the best ever, I finally took up with Orpingtons in 1904 and will stay with them as long as I keep a chicken, because they fill the bill as one of the best general purpose fowls that was ever bred. Hens that will lay near the two hundred egg mark, all through a flock and will dress seven or eight pounds of good, wholesome chicken meat do not find rivals every day; and any flock of Orpingtons that are bred and raised right will do this. Take them from chick to market and they are satisfactory all through. The chicks are hardy, easily raised, quiet and easily kept in bounds. They grow like weeds and until they commence to run to leg are fit for the table at any time. After they commence to make long legs it is better to leave them for soft roasters. The pullets will commence to lay at six months of age and lay good sized eggs that will bring the same price as hen eggs.

For those who like a yellow legged fowl there are the rocks of all varieties, all good and as handsome as the best. The Rhode Island reds and whites; the Langshans, black and white, are another good

old breed, lacking the yellow legs but good general purpose fowls. The Wyandottes are also general purpose fowls and these can be seen in all colors. No other breed of fowls have quite as much variety in feather and most of them are beautiful. Like the Orpingtons the Wyandottes are very quiet and docile, while rocks are more pugnacious. There is good fighting blood in the Barred Rocks, but if you get a good strain they are wonderfully good fowls.

We see a few specimens at a poultry show at odd times of the old breeds, such as the dark and light Brahma, the Dorking and English Red Cap, but their day has passed; the newer favorites have taken their place. And while we had a real liking for some of them, I think it is a case of the "survival of the fittest."

At the present time we have so many good breeds, and all colors, both solid color and parti-colors are to be found in each breed, that it would appear as if any fancier can get just what he likes best, and as it has been said many times, "It is not exactly the breed that spells success but the man behind it."

This is true, for some men will not succeed with any kind of poultry, because they are not adapted to the work, while others succeed with any and all kinds.

Neither does it take any more to feed an Orpington hen than a small hen of any breed, because she utilizes every particle of food for the business of egg or flesh making.

As shown previously, the general purpose fowl embraces the American class, the English and the French, and nearly all colors and varieties can be found to please everybody, as also the color of shank and skin for those who have a prejudice or a liking.

There is one thing to remember in opening up a general purpose farm—all these fowls, except the French breeds, lay a colored egg. And when eggs are plentiful, these eggs are discriminated against, generally to the tune of one cent a dozen. When eggs are scarce, as they usually are in winter, they bring top price just as the white egg does. So this is such a small matter it is scarcely worth mentioning at all, but that this question generally comes up when a person is trying to decide and it is well to have the facts. I believe the prospects for selling eggs by weight was never better than at this time, and whenever that occurs, the breeds that lay the dark egg will surely come into their own.

For a general purpose fowl, there can be no mistake in choosing a breed from either the American class or the English. Get good birds to start with and keep them good by introducing new blood which tends towards vigor and health. Unless the intention is to breed for the fancy, you need no line breeding chart or other frills. Find a good, reliable breeder of pure bred stock and recruit your flock by his blood once a year. In this way, by branding the chicks

of this product you can always know how they turn out and just what they are.

Business methods must be used in the poultry business, as in all others. It is the haphazard methods that cause failure. And it is business to know what the stock you have is. That is the best asset the poultryman has, and the only one of keeping in touch with progress. New blood is what makes for vigor in chicks and the new blood is best obtained for vigor alone, **by crossing males of new blood on the flock of females.** For feathers it is best to cross on the female side.

The chicks from a cross on the male side are the ones that will stand crowding as broilers, but if the pullets are to be raised for layers they must be separated as soon as the sex can be determined. By following this rule the profits will be very largely increased. Of course, care must be taken that the males are from good laying stock and also of good type for the breed they represent, as very much of the success depends on the selection of males.

CHAPTER XXVIII

CAPONS

This is a branch of the poultry business that is not much followed in California, and yet it can be made one of the most profitable side lines of the business.

A lady near Los Angeles, who breeds Wyandottes, started to raise capons for market some two years ago, and her experience was that she needed a factory where she could turn out so many a day. The S. P. and Salt Lake R. R. Companies would have taken several dozens a week, and of course, she could not supply the demand, because she had only a small place and a few hundred chickens. This is not a supposition, for the lady told me the facts herself.

Another fact I can vouch for in regard to capons is that of a friend in Sonoma County who caponized some White Orpingtons, that increased in size at a much less cost for feed when if they had been left in a natural condition. The birds were just as quiet as hens; he kept them in a very small yard and at the age when they would have brought about ten cents a pound if the owner had kept them so long, they netted him thirty cents a pound, and each one weighed from ten to twelve pounds.

Now these are facts that I can vouch for, and it would appear to me that there should be more enterprising poultrymen who have a little ranch willing to try out this branch of the business. The fact that capons are quiet, making no noise crowing or fighting and that the meat is of such high quality, commanding a high price, should be inducement enough.

Best Breed for Capons

As a matter of fact, there is no "best breed" for anything wholly. The best breeds are always conditional, or dependent on what they are wanted for. In the case of capons for railroad dining cars I am told that a capon weighing from eight to ten pounds is the most desirable.

For this size capon the Wyandottes fill the bill exactly; these birds have a good breast, the meat is of good quality and white in color; or a Houdan and Wyandotte cross would be good.

The next in size would be the Barred Rocks, and by way of improving the quality of meat, cross with Cornish.

Favorolles are good birds for caponizing; they are large and have a good breast and the meat is white and of good quality.

The largest capons are those having a Dorking or Orpington male cross on the Brahma hen. These cannot be improved upon for size, quality of meat nor quantity of breast meat. And that is what people want who buy capons. They do not want a lot of leg muscle to fight with but all the nice, juicy breast meat that is possible to get on one fowl.

This fact should be borne in mind when you attempt to create breeds for capons: Always choose a male from a breed that carries good breast meat. A White Orpington capon is just about as good and as nice a looking capon as can be found and they will weigh twelve pounds at one year old without any special feeding.

There is a great deal said about the enormous weight of capons, but a great deal of it is just talk. It is not so much the gain in weight that makes capons profitable, but the quality of meat and the fact that you can keep them in peace in flocks that would not be possible unless they were caponized. And this is worth considering if you have neighbors who object to much noise.

When the bird is raised to fryer size it has taken a lot of food to make the bony structure. Now instead of selling then, when it is just a question of how many cents you can make out of that bird for your trouble, if you can hold him over to finish his growth, you can count on a dollar for your trouble.

The increase in price for the capon over what is paid for the fryer will more than make the difference besides paying for the extra feed. If there was no money in fattening poultry and caponizing would the packers have men going around buying up farm range stock? I think not, those kind of people have to be sure of a profit before they venture into an enterprise. And yet farmers and poultrymen for years have been in the habit of letting the very stock that could be caponized and made into dollars go for a few cents.

CHAPTER XXIX

PREPOTENCY AND PROLIFICACY

This is a subject that poultrymen have neglected, or at least not given it the consideration due it. Prepotency is that quality that enables the parent stock to stamp their progeny with the same qualities they possess themselves in a large or small measure. In the male it has been paid little attention to, and yet it is through the male line that the females are most affected. The male bird of the type that has a big bump of prepotency is the best agency to breed up a good flock of prolific hens. If he is the product of a prolific hen and a prepotent sire, he will build up a poor flock into a good one in two or three generations, provided other things are taken care of.

There are always several factors in anything and the breeding of fowls is no exception to the rule. The factors that affect prolificacy are: First, parentage; some may call it heredity; second, selection, for not all the offspring from properly mated, prepotent males will always produce their kind. Therefore, selection must be paid attention to; and third, proper rearing. The latter includes several other questions that bear on the rearing of a fowl.

Selection must be practiced every year; there must be developed great digestive capacity, hardiness and activity. Proper rearing is that which develops all bodily structure and organs normally. This includes the bony structure, feathering and internal organs such as gizzard, egg organs and digestive tract. The birds must not be rushed, but must grow gradually until mature.

Having reared such birds, the next step as factors in their prolificacy is to maintain the characteristics as adults. They must have ample opportunity for exercise, winter or summer, in order to keep their digestive organs active. Their housing must be such as provides them with a dry house free from draughts while at roost, plenty of fresh air at all times and scratching room for bad weather. Never coddle them; too warm a house will make them tender and unfit to go out doors to rustle.

The feed must be good in quality and a variety wide enough to furnish material for egg making and bodily needs, there must be plenty of it but none to waste. An overfat hen will not lay well; neither will a lean hen. Try to maintain the happy medium.

Another important condition to promote prolificacy is absence of all vermin. These pests irritate and annoy hens past all endurance,

and it is very certain that they cannot do their best when they have to be under constant irritation.

The Hogan system of judging the prolific layers is a copyright book from which to quote is an infringement, but to those who fail to breed up and know the prolific hen from what has been said here I would advise them to buy "The Call Of The Hen" as advertised by Mr. Hogan.

But even the Hogan system fails in some cases. For instance, when the hens are not laying at all, all signs fail, partially. In moulting there is very little to judge by for nearly all the hens are more or less out of condition, and a person must be a very good judge indeed who can go into a yard, not knowing each individual hen, and pick out the best layers.

In such cases there is no infallible way of telling, though if the hens were laying, the trap nest would catch them even if other signs failed.

Knowing And Breeding The Heavy Layers

There are quite a number of methods of selecting the laying hen that to an observing person are as good as though the hens were trap-nested, but the trap nest saves a person from exercising his observing powers and gives him exercise for the physical. Of course, the trap nest is reliable and if we want statements to put on record that is the way to get them. But the ordinary person has no time to trap nest a lot of fowls; it is a slow job, and to prove anything must extend over a length of time.

One of the best methods of increasing the productiveness of a flock is to select only the very early layers. These should be banded and the numbers entered in a book set aside for that purpose. These early pullets should be bred from, and the pullets that come from these watched again for early layers. These early pullets will usually be found to lay a considerable number of eggs before the others start.

Another method of selecting and breeding a flock of winter layers is to hatch all eggs laid by the hens that lay the longest in the fall without moulting. These pullets will invariably prove good winter layers.

In selecting layers from a flock, three things should be carefully considered: First, the shape; second, the comb, wattles, and face; third, the actions of the hen.

The shape, is what is called, type in breeds, but no matter what breed it may be, the laying shape is a hen that is wide behind, legs well apart and having a long back. This gives great lung capacity, big digestive organs and large egg bag. The crops of good layers will usually be found full at night because they need the food and

will get it. The poor layers don't need but just so much to keep up their bodily needs and their crops will be found to be about half full. If the fingers are greased and inserted in the vent, the size of the egg bags may be determined, those laying heavily will have large bags and the poor layers small ones.

The head of a good layer is distinctly feminine; that is, long and slender, after the manner of a good milch cow's head. The color of the face, comb and wattles in the laying hen are nearly always of a bright red, especially in pullets that are just commencing to lay. A pullet that has not commenced, but is about to commence laying, will show a very bright red comb.

In hens or pullets that are about to lay, the plumage usually gives a better and brighter luster; but those who have been laying heavily will have very dingy looking feathers, while the poor layers are much brighter in plumage. These things can all be observed best in a yard where there are both kinds of layers to choose from. A hen that has laid heavily all the season has had very little feed to spare for feathers and they get very rough and faded, while her sister that has laid only every other day or so could put some of her time and substance into feathers and so looks much nicer. Actions of the hen: Early laying is one of the best indications of a good layer. A hen that is going to lay will usually be found singing and chuckling to herself a good part of the time. She is always alert, too, after the bits to be found, and is generally hunting and digging after something; her spirits are too high to let her lay around dull.

She should be in good condition, because neither a real fat hen nor a real lean hen can possibly be a good layer. You want the happy medium, and these are the hens that will be active without being too nervous and restless. A hen that waddles like a duck when walking is not always a fat hen, if she is grasped by the abdomen and the seeming fat is hard she is a good layer and that which appears to be fat is muscle.

A little observation will enable anyone to pick out the best layers in a yard. Drones never fight and rustle after their share of the feed; this is one of the surest tests there is; they are content with little; they spend their time pluming their feathers or basking in the sun or shade but not hunt around or dig. A good layer must eat, and if it is to be found she will find it at home or abroad if given her liberty; if shut in she will get a big share of all that is served to the flock. A big layer is a big eater. Nature made her so.

CHAPTER XXX

THE MEDITERRANEAN CLASS

In the Mediterranean classes we find all the Leghorns; the Minorcas; Spanish; Blue Andalusians and Anconas, and each variety has its admirers and fanciers.

White Leghorn Most Popular.—But on the California egg farm where poultry is kept as a means of earning a livelihood the White Leghorn is pre-eminently the favorite. The points chiefly in its favor are that it lays the white egg of commerce, matures at a fairly early age, can be bought cheaper than most other varieties, is hardy and when given range is a good forager, because it makes no distinction between its owner's garden and his neighbor's. The same might be said of all Leghorns but the popular opinion is in favor of the white. As a table bird it sells when the dealers can get nothing else, but they do not crave for that variety, perhaps because of the numbers that are put on the market. But there is no gainsaying the fact that a flock of good-sized, well-bred White Leghorns foraging on a California alfalfa field does present a picture to be admired.

The American Poultry Association has made a weight standard for Leghorns, and that will stop the breeding of the very small kind, at least among breeders who aim to exhibit.

The single comb White Leghorn is the variety bred on this coast, rose combs being very scarce and kept just as fancy.

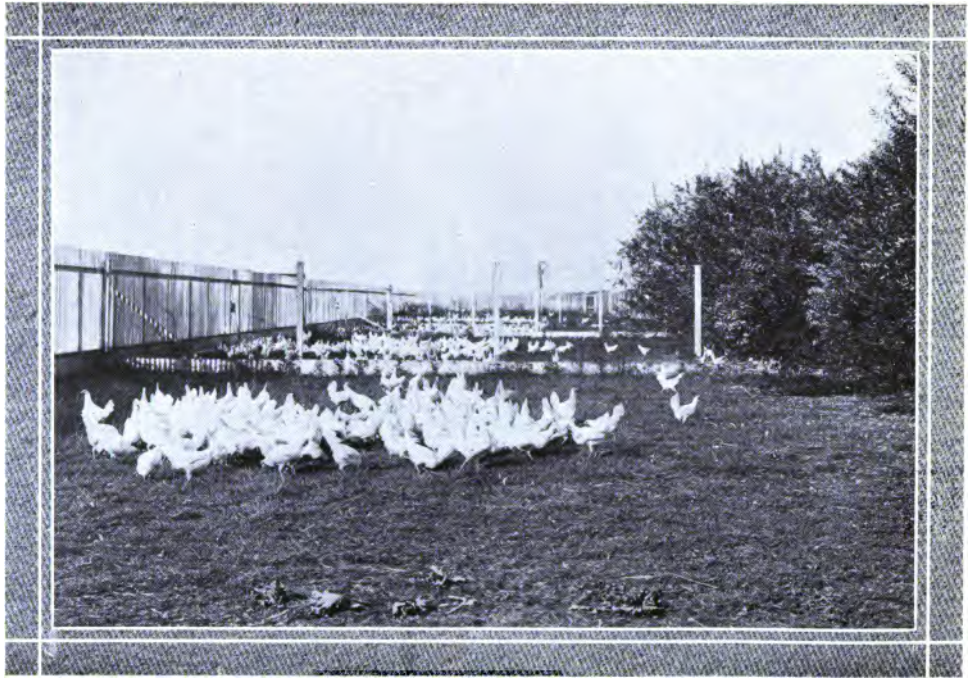
Color of Male and Female.—Web, fluff and quills of feathers in all sections, pure white; beak, yellow; eyes, reddish bay; comb, face and wattles, bright red; earlobes, white; shanks and toes, rich yellow.

For commercial purposes the White Minorca has been crossed on the Leghorn, and this makes for a larger body, and also a larger egg, but in that case you have white legs very often a mongrel bird at best, and a possible loss of hardihood.

Single Comb Brown Leghorn.—The Brown Leghorn male is, when well bred, one of the most beautiful birds. He has a proud carriage all his own, as if he were handsome and knew it. A fancier will always prefer the Brown Leghorn to any other variety of Leghorn simply because of the color and symmetry of them. But, along with this they are excellent layers, and they have the advantage of standing the heat just a little better than most fowls. Perhaps one reason why they are not more popular is that real good exhibition specimens are hard to breed, as double mating must be resorted to to get good

HOVER REFERRED TO ON PAGE 41.

TO TAKE TEMPERATURE JUST LIFT OUT THERMOMETER AND READ.



POULTRY YARD NEAR STOCKTON

birds of both sexes. Then again, there is a little game in them and they are more on the fight than the White variety. This streak of game also shows at times in the eggs which are not so pure white in color as the others. But that they lay more of them is a certain fact, for I have kept both and a good strain of Brown Leghorns cannot be beat as layers.

The single comb variety is most popular here and in size they are decidedly in advance of the Whites. As egg producers they stand A1, and the table qualities are slightly better than the White

Color of Male and Female.—Head of male is dark red, beak horn; eyes, reddish bay; comb, face and wattles, bright red; ear lobe, creamy white; neck, brighter red than the head with a greenish black stripe running through each feather and tapering to a point at the end; wing bows, rich brilliant red; primaries, black; secondaries, black with streak of brown on lower edge; coverts, greenish black; back and saddle, brilliant red with a greenish black stripe, tail greenish black; breast, black; body and fluff, black; legs, yellow; toes, yellow or dark slate. The hen is dressed in the more sober color of brown, both golden and dark, yellow legs and toes and face bright, with red comb and wattles. No prettier bird walks than a well-bred Brown Leghorn.

Minorcas.—There are three varieties of Minorcas, the Black, White and the Buff. The last named variety was originated by the Lingren Brothers of Kingsburg, California. Whether the California variety can be called Mediterranean I do not know, but the white and black are of the Mediterranean class. These are the largest of the Mediterranean class. Cock should weigh 9 pounds and that is a good weight for a light bird. Hen, 7½, pullets 5½ and cockerel 7½. Color of male and female, black with black beak, dark brown eyes, white ear lobes and dark slate color legs. The plumage, though black, is set off by a lustrous green on the surface of both sexes, and this, with the striking white earlobe and strong stately carriage of the male, makes a picture worth looking at.

The comb of the male is large and upright while that of the female droops on one side of the head.

The Minorca is noted for its large white egg. As a table fowl they are not to be despised, though in the black variety their plumage is against them. The meat is good, and only for the black feathers the Minorca would be considered one of the best general purpose fowls. They are usually kept where a select trade in eggs can be worked up, as the eggs, pure white in color, are of large size and good shape, also they are laid in numbers. In fact, it is difficult to find a breed of fowls that can outlay a good strain of Black Minorcas.

White Minorcas.—The white variety have the same weights as the black, the only difference being in the white plumage, and white in-

stead of black legs, beak, etc. There are some very fine specimens of both varieties in California.

White Faced Black Spanish.—This is a very old breed and a good one. They lay extra large eggs, as large if not larger than Minorcas. Their chief attraction is the large white cravat, or face, as it is termed. In a dry climate like ours the white faced black Spanish fowl ought to be at its best, but some way very few specimens are exhibited, even at the larger shows. It appears to be only a fancier's fowl in this State, but in England years ago they were kept for their great laying qualities.

Blue Andalusians.—The Andalusian is another of the class of white egg layers, and it is a good layer, too. It also has the distinction of dressing in the National colors. It is a smaller fowl than the Minorca but of the same type. It lays a white egg of good size and the fowl is about the same size as the standard set for Leghorns. Cock 6 pounds, cockerel 5, hen 5 and pullet 4 pounds. They are too small to rank very high as table poultry, not common enough to take their place on the utility egg farm, but for the small farm or the fancier they are a good fowl.

Anconas.—These birds have been getting into favor as an egg breed very much of late, and are certainly being called for in numbers. Some of their admirers claim that eventually they will sweep this Coast and be the commercial egg fowl. They have no weight clause in the Standard, but are supposed to be about as large as a good sized Leghorn. They are rated as good layers of large white eggs; the quality of meat not so good as the Leghorn. Disqualifications are, red in ear-lobes covering more than one-half the surface; red in any part of plumage; shanks other than yellow or mottled with black.

The claim is often made for all these small breeds that they are non-sitters, but like a great many other claims it is not strictly true. Some of these non-sitters are sitters of the most inveterate kind, and even when given eggs they will leave them and go and sit on an empty nest. Some, on the other hand, do sit and make good mothers; however, it only goes to show that whether a hen sits or not, nature intended her to take a rest somewhere in her busy season, and if hens do not sit they take the rest anyway.

CHAPTER XXXI

THE AMERICAN CLASS

In this class are included all the rocks, buff, white, barred, silver penciled, partridge and columbian. All the Wyandottes, silver, golden, white, buff, black, partridge, silver penciled and columbian, Javas, black and mottled. Rhode Island Reds, and Rhode Island White and Buckeyes.

In size the Plymouth Rock family are medium: the standard weight for a cock being 9½ pounds and for hens 7½. This is the same, no matter what the color. But a great many Rocks make heavier fowls than that. The Barred Rock is a difficult bird to breed as an exhibition bird, many fanciers after being successful with other varieties fail on this. In the class of a utility bird or general purpose fowl it is one of the best for a farm, quiet in disposition, easily kept in bounds by a four-foot fence, it makes a good layer of rather dark colored eggs, and when ready for market, tickles the palate of an epicure.

The fancier has something to try his genius in the Barred Rock, and if he fails his birds are still worth all the time he has given to them as general purpose fowls. The legs and skin of all varieties of Rocks are of that color so beloved by the colored preacher, who calls for a yaller-legged chicken. Yellow legs and skin are no longer a fetish in California, however, as we have learned that the color of skin in just "skin deep" and neither flavor of flesh or quantity of same is dependent on color.

The White Rock.—This bird has all the good qualities of the Barred Rock and a few more. Being white and solid colored it is easier to breed as an exhibition bird and this State can show some wonderful specimens, that could no doubt win at large eastern shows. Then, too, as a utility bird it scores, for many claim it is a better layer than the Barred variety. But the laying qualities are greatly dependent on the strain and no reliance can be placed on anything but personal knowledge. Anyway, the White Rock is a good general purpose fowl, hardy and quiet in disposition. The hens of both these varieties are good mothers and layers. They are at their best at two years old, and for profit should not be kept over that period, unless for the fancier.

Buff Plymouth Rock.—This bird has all the characteristics of the Rock family and a few others that have been bred in by color. The

lovers of the Buffs claim a greater egg capacity for their favorites, and this is just possible, because, while the buff color was being bred in there had to be some other blood introduced, and if this foreign blood was of a good laying breed, it would certainly affect the progeny some. The same weight, build and color of skin and legs are to be found in the buff variety as in the others.

The Silver Penciled Plymouth Rock.—These are very beautiful birds, particolored, with the perfect carriage of aristocrats and the dress to match. They have only to be seen to be admired, and for a small home place where one likes to have nice birds around them the silver penciled rock would fill the bill.

The Partridge Plymouth Rock.—This is another triumph of the breeder's art in the Rock family. The Partridge Rock is the most beautiful of all. Its bright red plumage mixed with black, yellow legs and bright face make it a striking object. And it has claims of egg laying that makes it a bird for the small home and fancier, but all these particolored fowls are beyond the skill of the farmer and average poultry raiser. They are strictly fancy breeds for the man who has the time and taste to give them the care they must have to give satisfaction.

Wyandottes.—The same rule applies to the Wyandottes. All the fancy feathered varieties like the Silver Laced, Silver Penciled and Partridge, are birds for the lover of fine feathers. They all have sterling qualities, too, but they require too much care for ordinary places. The business kinds of Wyandottes are the White, Buff and Columbian. The White Wyandotte is a good practical breed. They lay large brown eggs and in paying quantities. The meat is excellent in quality and if bred up to standard they are a fair sized bird. Standard weight of all Wyandottes is cock 8½ pounds, cockerel 7½, hen 6½, pullet 5½ pounds.

The Wyandottes have a peculiar shape or type, a little unlike all other breeds, in that the back is broad and short. The body is round and deep and the small rose comb fits close to the head, giving the bird a full, round appearance. As a market fowl the Wyandotte ranks A1. The Orpington and Wyandotte are in one class in the San Francisco market and bring a little higher price than any other breeds. Though I do not think this is the case in eastern markets where a yellow skin and yellow leg holds the premium. This is a high compliment to the intelligence of our people, who judge more by taste than from any old myth about color. The skin and legs of all Wyandottes are white, the meat is juicy and of good flavor, and the fowls are quiet and docile; easily kept in bounds and always ready as broilers (for which they are noted), fryers or roasts.

Rhode Island Reds and Buckeyes.—During the last few years this breed of fowls has created quite a stir, but while they are good layers

of dark colored eggs, their persistent broodiness and loss of color seems to go against them. Standard weights are the same as in the Wyandottes, except the pullets, which is given 5 pounds as the weight. The skin and legs are yellow. Like all new breeds they held the stage for awhile and some real money was made by the fanciers. They make good foragers on a farm but soon deteriorate in plumage no matter what price you pay for a start. The size and color of eggs are against them as a commercial egg laying machine.

They are, however, hardy and make good on the farm where they can have range and shade. They are pre-eminently an American breed and take the name of the place from which they originated. The Buckeyes are a separate variety that were originated by a lady living now in California. They were very similar tc the Rhode Island Reds except for the comb, which is a pea comb. Now the Buckeyes are admitted to the Standard. The weights are 9 pounds for cock; cockerel 8 pounds, hen 6 pounds, and pullets 5 pounds. In color and shape as in other qualities, the two breeds are very similar and each variety has its admirers.

CHAPTER XXXII

THE FRENCH BREEDS

The Houdan is by far the most popular breed the French have. It is a very old breed, and in some parts of this State is very well liked, but in many parts the top knot or crest is against the bird because it is a harbor for lice, fleas and is also a hindrance to the birds in protecting themselves from the common enemy the hawk. The Houdan is a good layer of large white eggs, these eggs are the size of well bred Minorcas and command the best price. The birds have large breasts and the meat is good. They are one of the best breeds I know of to cross with on other white egg breeds, but to be good the cross must be of female Houdans to a male of the other breed.

The Houdan is really a black plumaged bird but the feathers are stippled or penciled with white, and as the birds get older the white markings increase. They are quiet and do very well in a low fence, but they should never be mixed with other birds of a more aggressive nature, as being so timid they fall back from the feed and let the others have all of it. The Houdan has five toes. The chicks are so hardy that it is hard to kill them with a club, and if the crest could be bred out I know of no better fowl for a ranch fowl that is run for profit. Standard weights are, cock, 7½, cockerel 6½, hen 6½ and pullet 5½. The cock is tall and stately like the Minorca, giving an appearance of being much larger than he is, while the females are shorter of leg. The comb is V shaped and a flock of well bred Houdans are a good investment in localities where they fit in.

Crevecoeurs and La Fleche.—Of these two varieties of French fowls very few are found in California. They have black plumage and are a little larger than the Houdans, the Standard calling for half pound more in all classes.

The Polish.—Polish fowls, like the French, run largely to crests and beards. As they are more of a fancier's fowl we will not take up much time with them. There are the White Crested, Black Bearded, Golden, Bearded Silver, Bearded White, and the non-bearded varieties of these colors. As pets and fancy, for anyone with the time and taste, these little birds appeal. They lay fair sized eggs and plenty of them, but are too small to be marketable.

The Hamburgs.—These are another of the small varieties that are from a fancier's standpoint beautiful in colorings and symmetry. In my young days they were the common fowl for everybody and were

called "Dutch every day layers," and it is a fact that they did lay every day. But the eggs are too small to go in our markets, so outside the fancy, they don't appear to have much call. They are indeed beautiful in marking and coloring and are sprightly, well proportioned birds.

The Campines.—There are the Golden and Silver Campines. These birds hail from Belgium. They are really very little larger in appearance than some of the Hamburgs, but they have had a big boom the past two years. Personally I do not know much about them but suspect the boom will fall in and the legitimate trade be turned back to standard breeds. These birds lay a white egg of good size, but the egg is about all that can be made from them. They never can be called a general purpose fowl at the best.

Buttercups.—This is another new breed that is trying for honors. Its admirers claim for it the 300 egg a year hen. It is a small bird, with a comb shaped like a buttercup, from which it takes its name. Several years ago when the name first became known here I sent east for a setting of eggs. The claim for these birds is that they lay a white egg, large in size and more of them than any other breed. Now, that is saying a whole lot in a few words. The eggs I sent for came in due time, and every one of them was of a creamy color that could never be stretched to white, no matter how strong the imagination was. They were of fairly good size and I gave them to two good hens, so that if one had any accident the other had a chance. One chick hatched, and after keeping that six months, an Indian's dog got it, and that was my last Buttercup. But I see some at the shows once in a while and so I am satisfied.

CHAPTER XXXIII

THE ASIATIC CLASS

This class is what are really the heavy breeds of fowls. It includes the Brahmas, Dark and Light; the Langshans, White and Black; and the Cochins, Buff, Partridge, Black and White.

In England and the eastern States these large heavy birds were at one time very popular, but here in California we see but very few of them and these are held by fanciers. They are too large, and too heavily feathered to be very good in a warm climate like ours. Though the Langshans and Brahmas have many friends, even here.

The Langshans are large, majestic birds heavily feathered to the toes. They take a long season to mature in but are good winter layers of large brown eggs. The Standard weight for these birds are not so high as that for Orpingtons, yet they give the appearance of being much heavier, probably on account of the legs being so heavily feathered. Standard weight for cock is 9½ pounds; cockerel 8 pounds; hen, 7½ pounds and pullet 6½ pounds.

They make good table birds, but very few except French cooks like them on account of the color of the skin of the black variety.

The Brahmas.—These big quiet hens were great favorites of mine forty years ago. That was the heyday of their prosperity. I got some eggs from the Earl of Derby and walked five miles after them. And to tell the truth, I like them yet, but at the same time, I do not think they are profitable in this climate.

Standard weights for Brahmas are, cock 12 pounds; cockerel 10 pounds; hen 9½ pounds and pullet 8 pounds.

The Brahmas are good layers, good sitters and mothers and being so heavy they do not ramble at all, but they are usually clumsy and kill chickens by stepping on them.

Cochins.—We still see a few of the big fellows at the shows simply because every bird living has its fancier and admirer and the Cochins appeal to some people. To me they are nothing but a bag of feathers.

While they look massive, they are in realty not as large as the Brahmas. But at one time they were quite popular as table birds. Standard weights are, cock 11 pounds; cockerel 9 pounds; hen 9½ and pullet 7 pounds.

The Asiatic class are not very numerous in California, the smooth legged varieties and breeds of fowls being considered best for our climate. The heavy feathering on legs and body makes it look more difficult to keep them free from vermin.

The Brahmas, both light and dark, are very handsome birds and make fine roasters, but they require a long time for their growth, and we have other breeds that can mature in half the time and be laying. For the small ranch that wants a good sized fowl and has not much room the Brahma is better than turkey. They never ramble, are not very heavy eaters and they do make a delicious roast. The eggs are rich and of fine flavor but not laid in quantities to suit a modern poultry man.

CHAPTER XXXIV

THE ENGLISH CLASS

The English class comprise the Dorkings, White, Silver-Gray and Colored; the Redcaps and all varieties of Orpingtons. They all are what may be termed a general purpose fowl, are good layers and excellent table fowls. The Dorkings are among the oldest breeds of fowls and have always been liked. The male is large, broad in the back and low in shank, giving him a solid, compact looking body. The female is broad and with a length of back that gives the idea of roominess for egg making. And the old-fashioned Dorking came pretty near to being an egg machine. The skin and flesh of all Dorkings are white, and they lay a large white egg. They have five toes, a four-toed Dorking would meet disqualification in the show room. The Dorkings are of three varieties, the Silver Gray, which is the most popular here, the White and Colored Dorking. The Standard weights for the Silver Gray are cock 8 pounds; cockerel 7 pounds; hen 6½ pullet 5½. The Colored Dorking runs one pound heavier on all both male and female, while the White Dorking is between the two. There are not a great many fowls of these varieties in California, not because they don't do well or anything is against them, but probably because newer breeds fill the bill and the old breeds are neglected.

The Redcap.—This is another old English variety that is hard to beat, yet it is not found in numbers in California. Lancashire and Derbyshire are the two English counties where Redcaps are bred to any great extent. As layers, there is no breed of fowl that can beat them, of that I can speak, for I have kept them for years, but have none now. They lay a white egg of medium size and the meat is white with a gamey flavor, skin is white and legs of a dark slate color. Standard weights for cock is 7½ pounds; cockerel 6 pounds; hen 6 pounds and pullet 5 pounds.

These are the only one breed of fowls that I know of in any class that are absolutely and truly non sitters. I have kept them at different times and had stock from different places and never yet saw a Redcap stay on the nest five minutes after it laid. The fowls when mature are healthy and hardy, they are good layers during the spring and summer, but like most of the non sitting varieties do not lay as well in the winter months as the heavier feathered breeds. They get their name from the comb which in the male covers the head, forming a cap. They are very handsome particolored birds that require no

skill to breed the right feathers, being so old they breed true every time. Color of female, golden brown and greenish black; color of male, rich dark mahogany red, golden brown and lustrous greenish black. It requires an artist to describe a good specimen of English Redcap male. Each feather is so correctly marked with a spangle or half moon and all are so arranged that the bird is a real picture.

Orpingtons.—If the Redcap were an early love the Orpingtons are the last and best love, for I do not ever expect to give up Orpingtons as long as I keep any fowls at all. These are the largest of the smooth legged breeds. There are several varieties but none very extensively bred in California except the Buff, Black and White. These three are the recognized standard varieties of Orpingtons.

Fanciers spend money freely to keep up and maintain the type and beautiful color of their favorites. The Buffs, with the rich golden color both under and surface; the Blacks, the rich lustrous black that judges demand, and the Whites, free from foreign color and brassiness.

The skin and meat of all three varieties are white. The legs and feet of Whites and Buffs are pinkish white and the Blacks are black or slate color.

All three varieties are popular and no one can justly say that one is better than the other. The Buffs and Whites in pens side by side do not differ in egg production so that it can be noticed. The only real difference is in the personal taste of the owner of each color. The legs are rather short, standing well apart to carry the weight of flesh. Standard weight for cock is 10 pounds; cockerel 8½ pounds; hen 8 pounds and pullet 7 pounds. And I have hens that have been famous layers weighing ten pounds. But Standard weight is a good size for all practical purposes and if kept busy they will not accumulate fat.

The Orpingtons have made a reputation for themselves as the best winter egg producers we have, and the reputation is increasing by leaps and bounds, because the fowls live up to expectations when given half a show.

The chicks are hardy, quick growers and until they begin to run to leg are always ready to sell for broilers or fryers. As roasters they are world beaters and the most remarkable feature of the Orpington hen is, that it continues to pay its board until six or seven years old. At three years old they are in their prime and will lay quite as many eggs as in the first year if kept from putting on fat. This can be done with exercise and correct feeding.

Buff Orpington.—This variety is in color buff, a golden color all through when for exhibition. Earlobes, wattles and comb all red and with the golden buff of the feathers fitting in makes a pretty picture. Color of shanks white or pinkish white, medium comb having five points. Positive white in earlobes or any foreign color in plumage is a disqualification.

White Orpingtons.—With the exception of color of plumage the same description answers for these. Plumage is white, and the feathers must be free from foreign colors, but creaminess, or what is termed brassiness, is not a disqualification, though it is a defect. Our climate is hard on all white birds and the white Orpington is not an old enough breed to have had the defect bred out. Bleaching and all other external methods of changing a brassy bird into a white one is but a temporary change, the brass comes back, but when it is bred out it stays out.

Black Orpingtons.—These are the most majestic of all the Orpingtons, but as I have never bred any I can not speak from personal knowledge. However, they are accredited with all the good qualities of the others and for city dwellers, where there is much dust and dirt, they sure should be the favorite.

All the Orpingtons are good layers of good large eggs with a brownish color, though many White Orpingtons lay a very light colored egg. The winter season is the Orpingtons' summer, for they love cold rainy weather and shell the eggs out as if the sun were shining. They make good mothers usually, commencing to lay before quitting the chicks. In fact, many times they stay with one bunch of chicks until ready to sit again, but if not needed for that chore they can be put in a yard with the male and they will forget all about it.

CHAPTER XXXV

GAMES AND ORIENTALS

In the Oriental class we find the Cornish. This bird is a cross that was originated in Cornwall, England, by crossing a black breasted Red Game with a Red Aseel from India. The Derby Red Game was a large bird as I remember them, with very heavy thighs and legs. This shows in the Cornish, also the massive breast, the bone being well set in gives a rounded appearance and there is an abundance of good meat on the breast.

The Cornish are bred chiefly as table fowls and their close plumage and clean legs make them well fitted for this climate. Around Los Angeles are several flocks of goodly numbers and the show rooms are fairly well supplied with good specimens. It is not claimed for them that they make high egg records, still eggs from game birds rank high and the meat is of the first quality. Standard weights are, for cock 9 pounds; cockerel 8 pounds; hen 7 pounds and pullet 6 pounds. The Cornish are well set up birds, giving an appearance of great strength. The legs are set well apart as in the old days when their ancestors combatted in the pit. These are the largest of the Game varieties and with the exception of a very few bred by fanciers there is no extensive breeding of other game breeds, except in Bantams.

Game Bantams.—The Black Breasted Red Game Bantam is the one mostly exhibited in our poultry shows, so we take it that must be the most popular breed or variety.

These little fellows call for ounces instead of pounds in the Standard of weights, and a bird that is too heavy is disqualified. Color of male is: Head, light orange; eyes, red; comb, face, wattles and earlobes, red; neck, hackle, light golden; wings, shoulders, black; wing, fronts black; wingbows, red; wing coverts, lustrous black, forming a bar across the wing; primaries, black, except lower feathers, which should be bay; secondaries, part of outer web forming wing, bay, remainder of feathers, black; back, bright red; saddle, light golden; tail, black; sickle feathers and tail coverts, lustrous black; breast, black; body and stern, black; thighs, black; shanks and toes, willow green.

Color of female same, but on a more sober plan. All cocks must be dubbed. Standard weight is: cock, 22 ounces; cockerel, 20 ounces; hen, 20 ounces and pullet, 18 ounces.

Ornamental Bantams.—These little fellows are far more popular than the fighting kind and these are the kind parents should encourage their boys to breed. Among Ornamental Bantams there are the Seabrights, Golden and Silver, and these birds are really beautiful in color and symmetry. Then, too, the plumage of male and female is alike, which makes it easy for a boy to breed good specimens. Also they are wonderful layers and as the body is a little larger than that of the game varieties, there is more to eat when one is to be used for the table. Cock's weight is 26 ounces; cockerel, 22 ounces; hen, 22 and pullet 20 ounces. They have clean legs, upright carriage and well spiked rose comb. In the Silver variety the plumage is silvery white, each feather evenly and distinctly laced all around with a narrow edging of lustrous black.

With the Golden variety, the plumage all through is of a golden yellow, edged around with the lacing of black. Both varieties were originated by Sir John Seabright, whose name they bear, and no man could have left anything better for the children of the world than these two varieties of miniature fowls.

Rose Comb Bantams.—This breed is a clean leg, close plumage breed. There are but two colors, black and white. This and the different color of legs are all the variety to be found in this breed. Both have rose combs. Comb, face and wattles are red, while the earlobes are white. Standard weights same as Seabrights.

Booted White Bantams.—These little fellows are pure white, the vulture hocks form the boot. They appear to be on stilts when walking, as the feathers on the legs must be stiff. Standard weights same as Seabrights.

Brahma Bantams.—The Brahma Bantam must conform to the shape, color and general makeup of their larger brothers. They must be feathered down the leg, have the same pea comb, face, comb and earlobes red. They are just simply miniature Brahmas, both light and dark. The little hens are good layers, good setters and excellent mothers. Standard weight is for cock, 30 ounces; cockerel, 26 ounces; hen, 26 ounces and pullet, 24 ounces.

Cochin Bantams, Buff, Black, and White.—The Cochin Bantams, of all colors, are more largely bred, hence more popular than any other breed. The blacks are perhaps not quite as much in evidence in the show room, because it does not need much discrimination in color, a good bird is more easily picked out and if all other points are right, it stands a show to win. With the Buff variety it is quite different; one person's idea of a "Golden Buff may differ several shades from another person's idea, and especially from the person who happens to be the judge. So, there is always more competition in colors than in Black or White varieties.

The Cochin Bantam is a good layer, not only that, but if you want eggs in winter and have just the smallest kind of a yard with a small tight-roofed box to set in it, you can have eggs all winter long for your own table. Then, if well fed and hatched early they make a good, big plump broiler that nothing can beat, and they can be raised just as easy as any kind of feathered birds. The hens are good sitters and good mothers, protecting with all the powers at their command the chicks entrusted to their care. If they see they are likely to get their brood hurt by cats or anything too large for them, they will set up such a commotion that the whole neighborhood will turn out, thinking it is a fire.

It is safe to say that the little fellows have more than their share of intelligence. Cochins and Brahmas are among the very best of the Bantam family and while they like petting, they do very well if just fed and given ordinary care.

Standard weights for all Cochin Bantams are same as that for Brahmas.

CHAPTER XXXVI

DUCK CULTURE IN CALIFORNIA

The past two years I have received so many inquiries about duck raising that this part of the poultry industry demands attention. Ducks are the one thing that can be raised to advantage on town lots, or on very small holdings. It does not require either a great amount of money or room and that is why it can be done successfully by women. It is not really necessary that breeders be kept, for nearly all varieties of ducklings can be bought from hatcheries. For those who can find room for a few breeders, there is more profit to be made because the eggs will be at hand and they can set at any time they are ready, and this is not always the case where ducklings must be bought.

I will, therefore, take up the care of the breeding stock first, as the foundation of all success lies with the breeders. If you have a flock of young ducks on hand, select your breeders from them, taking those with the best developed bodies and earliest signs of maturity. Those hatched in April are the best for breeders. Now allow one drake to four ducks, and if you are on a farm or anywhere that has range, turn your ducks out on range, those intended for breeders.

Young ducks will commence to lay early in December in this climate, but old ducks very rarely commence until February. Breeding ducks can be fed very lightly if turned out, a little mash morning and night, made from wheat bran and middlings, is enough.

Along in October it will be time to house them, and begin to feed better, if you want early eggs, and as this is where the profit comes in, I expect you will want to have it. After October first give a mash morning and night as follows: One part bran, one part middlings, one part cornmeal, one part alfalfa meal, five per cent beef scraps and two per cent grit and oyster shell. Give them all they will eat of this morning and night, and all the green feed they will eat at noon. Keep water in the yard or house, if you have nothing better, a candy pail set in a hole in the ground does very well, but they must have water, to bathe in to insure strong fertile eggs.

About November first, increase the quantity of beef scrap to ten per cent. Lift the ducks up by the neck to see how thin they are, as you must not let them get too fat. If they keep too thin, increase the amount of cornmeal and add a little whole grain, such as wheat and cracked corn, to the rations. When they commence to lay, they

TYPICAL CALIFORNIA POULTRY HOUSES

FLOCK OF WHITE LEGHORNS

must be fed heavier, as they soon get poor if not fed plenty. Pekin ducks should lay from 75 to 100 eggs without stopping, but they won't do it if not fed right.

Don't forget that it requires good judgment in feeding breeding ducks, you must keep track of the condition of the layers.

There are fourteen different breeds of ducks in the United States, but only three or four varieties are ever seen much of on this Coast. The Aylesbury and Pekin stand first in favor, they are both good layers and make excellent table fowl; the Muscovy has some friends, but is generally fought shy of as being the mud hen of ducks. The Indian Runner is much in favor as a layer of nice white eggs, though not all Indian Runner ducks lay white eggs, for I have seen green ones among them. But the Indian runner does not fill the bill for green ducks; for this purpose there is none better than the Pekin. And if you have Pekins, you will not be disappointed in the results if you do your share.

Duck eggs hatch best in the incubator at a temperature of 102 to 103 plenty high enough, and the 102 to 102½ will give better results than the higher figures.

Carry them for two weeks at 102, the third week sprinkle the eggs once a day when you take them out to air and turn, and increase the temperature to 102½; the fourth week, sprinkle the eggs morning and night; the last four days before closing up the incubator and when you do close it up, increase the temperature to 103 and do not let it get under that until all are hatched.

Brooding Ducklings.—When they hatch, put in brooder and give warm water to drink in a vessel that they can't get into with anything but their bills.

Watch the ducklings for about two days and teach them where to go for warmth, then, when they learn that, your troubles are almost over. Ducklings are the easiest thing to raise in the whole gamut of poultry, and the most interesting. But there are some things that must be done, and a few that must not be done if you want to raise them. The two most important things to do is to be sure to serve water when you serve feed, because the eating depends on the drinking. The water must be in a dish deep enough to admit of the bill going in up to and over the eyes; if it is not, they will get sore eyes and present a most pitiable aspect.

The next thing to remember is that though water is essential, it must be warm water for at least ten days. The reason for this is that cold water causes cramps.

Feeding the Ducklings.—The very best feed I have found for ducklings is Spratt's Chick Meal. Cracker crumbs are also excellent. They come high, but will give your ducklings such a start that you

won't mind the price. With either food, warm water and a nice warm brooder, ducklings are in clover, and will grow like weeds.

The next best thing for a few days is rolled oats and stale bread soaked in milk. At two weeks old, you can change them gradually to a mash as follows.

Bran, one part; middlings, one part; corn meal, two parts; five per cent beef scrap, a little coarse sand and as much chopped lettuce as they will eat; mix the mash with just enough water to mix readily, adding some of the chopped lettuce, and feed lettuce between meals. Sprouted oats may be fed at any and all times, and they will certainly grow. As they increase in age, so also must you increase the animal food. Ten or even fifteen per cent animal food of some kind must be fed if they are to be sold as green ducks at ten or twelve weeks old.

Five Meals a Day.—At all the large duck ranches on Long Island, all feeders are out with the first meal of the day at six o'clock in the morning, and the ducks and ducklings both are fed as regular as the clock, five meals a day, all they can eat of a properly balanced food. That is the secret of their success, regularity and a well balanced food. I have seen people trying to raise ducks, who actually did not know the nature of ducks or their needs. Such people fail in the nature of things, but how much better it would be to learn the needs of ducks first, then raise them afterwards.

A Good Finishing Mash For Ducks.—About two weeks before the ducks are to be killed, the green feed should be omitted, as it injures the color of the flesh. The following mash can be relied upon to give good results both in quality and quantity of meat.

Corn meal, or ground corn 2 parts; ground oats 1 part; ground barley, one part; white middlings or low grade flour, 2 parts; beef scrap, 1 part. Now in measuring parts, the same measure should be used all the time; to 1 quart of ground oats, barley and beef scrap each, you add 2 quarts of corn meal and 2 of middlings or flour. Thus, in this mash, the beef scrap is one part in seven; this is rich food, but is only to be fed as a finishing food and only three times a day; if fed too often on such diet, the ducks would surfeit.

After ducks quit laying in the summer, give this mash two weeks before a Jewish holiday and send them to market. Duck raisers should post themselves on the Jewish holidays and prepare to make shipments for them, as they are in great demand during those times.

Dressing Ducks For Market

This is one feature in raising ducks on this Coast that is not much used, because we sell nearly all live products alive. This saves a lot of work that would be done by inexperienced hands and places

it in the hands of those that are experienced. Still if there is a call for ducks in a local market it is well to know how to kill and dress them.

Hang them in pairs on a line, head down, the killer goes along with a sharp knife and sticks each one in the roof of the mouth, at the same time hitting it a sharp blow on the top of the head, and pulls out the main tail and wing feathers. He passes on and a picker takes up the job of picking the first duck. Take the duck down as soon as dead, wash out the mouth and proceed with the picking. Or if to be scalded, have a pail of hot water and a pail of cold handy to dip the fingers in. Take the feathers from the breast first, then turn over and follow along the back, clean, lay on a board out of the reach of flies until all are scalded, then finish up. Every sign of feathers and down must be picked clean; after that is done, have a bucket of hot water and one of cold, as before, dip the ducks, one at a time, in the hot water, then immerse in the cold and leave until all animal heat is gone from them. The dipping in hot water, then in cold is called plumping, as it adds to the appearance of the ducks and does no harm it should always be done, if we want our products to look the best.

When the ducks are cold, wipe off with clean cloth, wrap in white paper and ship as soon as possible.

CHAPTER XXXVII

TURKEYS IN CALIFORNIA

There are seven distinct varieties or breeds of turkeys, but on this Coast the most popular are the Bronze and the White Holland. The Bourbon Red and the Narragansett are bred on a small scale by fanciers, but the commercial breeds are the Bronze and the White Holland. The former is the king of all turkeys in regard to size, the White Holland being the smallest breed of all.

Where there is range, the Bronze is the most profitable, but for small holdings and acreage the White Holland will give better satisfaction, because coupled with its smaller size is docility and an inclination to stay at home and be satisfied. It will even content itself in good-sized yards without any range at all, but as the turkey never has been thoroughly domesticated, it stands to reason that any variety will do better on range. Turkeys do not like the restraint of yards for any length of time, and unless natural conditions are given them there is a certain amount of loss that no amount of care or feed will offset.

The foothill lands of California are the turkeys' paradise. In most localities they can roam the hills, picking up acorns that drop from oak trees, wild vines and seeds and the insect life that always are a part of such growth. For the rancher with a few acres of hill land there is not anything that will pay a better dividend than a good flock of Bronze turkeys.

Fix up a few high perches in the barnyard and feed them a little when they come home at night and it is not often a band of turks will leave their home, unless scared away by some animal. They have a sense of safety in human nearness, hence, prefer to come home rather than stay in the woods.

Mating and Handling.—When turkeys are properly mated one may hope for a large measure of success, if other conditions are right, but if improperly mated nothing will go right and the measure of success will be very meagre. There must be no inbreeding, no weaklings of either sex, and neither male nor female must be too young or immature.

Old hens are preferable, and if young ones must be used, they should be at least over one year old, for a small flock a good strong yearling cock may be used if he has good bone and size, but for a larger flock a two-year-old male will be the proper thing. Always

choose one that is large and well-boned, and has good color and finish because the male influences the color and general appearance.

Have the hens as near alike as to size and appearance as is possible; if one is tall and lanky and another short legged and dumpy they will never appear as a good flock, neither will they fatten alike. The short legged full breasted turkey will not ramble so much as the long legged, lean, lanky type, neither will they require so much feed to fatten them and get ready for market. And these are things one wants to consider in mating up a flock for breeding.

In this California climate I have seen hens running around with broods at Christmas, and that as far north as Sonoma County. But unless the nest is in a very sheltered place the eggs are liable to get chilled. So the better plan is to remove the first few eggs, leaving a nest egg, and when the hen has laid half her clutch, if she is to be allowed to set them herself, give them back to her, and just cover the nest at night with an old piece of cloth.

Usually the hens lay from eighteen to thirty eggs, but I have had hens lay fifty and as high as seventy-five before wanting to set. But as a rule this is later in the season; the hens that lay first will not lay more than thirty.

But these first eggs are the ones that should be hatched and raised, for the large Thanksgiving turkeys. The later ones can be carried over for the Christmas holidays.

A Good Turkey Nest.

An old barrel with half the staves taken out, the end being set down in the ground on the windy side and dirt thrown up to the staves, makes a good, well-sheltered turkey nest. If a length of tar paper or some other roofing paper is fastened over the full length it will be better especially in counties that have heavy winter rains. A turkey likes to feel secluded, and if water and feed are put under the cover of the barrel and vermin kept away there need be no fears as to the results with such a nest.

During the laying period the hens should be well fed on food rich in protein, and it is well to not let them out of the yards during this period until all the hens have laid. If given their liberty before laying, they are very likely to hunt up a nesting place of their own where it would be hard to keep track of them.

It takes twenty eight to thirty days to hatch turkey eggs, according to how the eggs were cared for after being laid, and how old they are.

When it is possible, several hens should be set at one time, and each should be well dusted, at the time of giving them the eggs, with

insect powder, then again in ten days, and a final dusting the day before the poults are due to hatch.

If turkey eggs are hatched under hens the same precautions should be taken so that the poults can have a clear start.

Caring For The Poults.

Young turkeys are very tender, and the large turkey lice, if the hen has not been thoroughly cleaned, will go straight from hen to chicks. When this happens, the fight is on, and unless the chicks are from a very robust stock, it does not last long.

When she is hatching, make sure of this lice question by examination, and if the hen is clean, make her a sort of enclosure, three-cornered, with three twelve-inch boards, the original barrel nest should be left as it is for the hen to shelter in and the boards will keep the young ones from straying away from her. Having done this, let her have the quiet and privacy she desires until all the eggs are hatched. If there is any danger from skunks, weazles, cats or rats, one-inch mesh wire should be fastened over the board fence, otherwise it may be left open. For the first few days, I think the ideal food for young turkeys is a chick feed containing little or no corn. At least I would feed chick feed twice a day and curd, hard-boiled eggs and a plain custard of eggs and milk, together with onion tops cut fine, lettuce and even a little grated garlic mixed in the curds.

They must be watched constantly for signs of lice, for once they gain a footing the vitality of the poults is on the down grade. When the poults are about ten days old the lice problem may be solved by purchasing a small box of Mercurial ointment from a drug store. Find out what strength it is; most good ointments are 75 per cent. This should be mixed with an equal amount of clean tallow, well worked together with a knife blade, then take a piece as large as a bean and rub below the vent. Rub well into the skin; all lice go to the vent to drink, and they can't stand mercury. The mother hen may be treated in the same way; the reason I do not advocate the use of this ointment before the tenth day is the extreme susceptibility of the poults to any strong poison, but after the tenth day they will stand it that strength. Until then, depend upon the insect powder.

It is of great importance that the young be kept growing and to that end the feed must contain plenty of protein and feather making material, but fed in such a manner that they do not get surfeited. It is better to keep them a little hungry, feed little and often and give a variety.

Range is very desirable, but care should be taken that they are not out in the dew while very young. When they can get berries and insects, short grass and weed seeds, there is very little trouble with them. Once they have "shot the red" they are considered safe.

In starting in, it is always best to purchase stock from two parties widely separated so that there is no danger of inbreeding, for to inbreeding is due that fatal of all diseases of turkeys, "Blackhead."

It is claimed that even when all the food must be purchased, turkeys can be raised at a cost of eight cents a pound; whether this includes losses from disease or not I do not know. All statistics are more or less misleading because all facts are not included. However, there is and will be good prices paid for all the turkeys that can be raised on this Coast for a great many years, if not for all time.

Turkey Troubles.—The diseases that attack turkeys are similar to those of chickens in general. They get roup if crowded in poorly ventilated coops, canker in the mouth, head and eyes from cold or filth, and diseases of the crop and intestines. What will cure a chicken will cure a turkey. But the very best cure in all cases is prevention, one ounce of which is said to be worth a pound of cure, but believe me, when it comes to turkeys, one ounce of prevention is worth many times a pound of cure. Turkeys are a good deal like sheep, they soon give up. A sick turkey has no ambition to live and it is hard to arouse them.

"Blackhead" is the one dread of turkey men, and yet, on this Coast, it is very rare, and when properly bred it is never seen. The following mixture will often eradicate it even after it gets a good start in a flock:

Sulphur, 20 grains;
Sulphate of Iron, 2 grains;
Sulphate of Quinine, 2 grains;

mix the above and divide into two rather long pills, giving one to each turkey weighing six pounds or over; under that weight, this quantity may be divided into three pills.

Another good liver medicine is Podophyllum; and yet another that has been very successfully used in all kinds of turkey troubles is "Carters Little Liver Pills." These are sold at all drug stores as a cure for liver troubles in mankind, and I know of several cases where they have been used for turkeys and chickens both. Give plenty of onions and chopped garlic with the food and very little else will be needed.

Fattening Turkeys For Market.—To make a success of fattening turkeys, it is better to have them all of one size and as near one age as possible. This can easily be done by sorting out the largest or first hatches of the season and putting them into separate yards.

Fix one or two good high poles for roosts before putting the birds in the yards and arrange the feed troughs so that you will annoy the turks as little as possible after they are put in fattening quarters.

Give them plenty of water, but no food the first day, unless they get too restless, then a little grain may be fed.

The second day commence giving a moist mash as follows: barley meal, wheat middlings and bran, equal parts; add a little salt, just to flavor it and only feed what the turkeys will eat up readily. At noon, change ground barley for ground oats and feed as before. For the evening meal, cracked corn, all they will eat. By changing the ground feed every meal you not only give the turks a variety of food that is more appetizing than all one thing, but you are improving the juiciness and quality in general of the meat. After about a week of this diet, they will get tired of it in spite of the change. Then boil up a big kettle of small potatoes, put in a handful of salt while cooking and any fat or grease of any kind that is on the premises; when the potatoes are soft, take a masher and mix in ground barley as you mash the potatoes. If cracklings can be obtained, boil a good lump, say ten or fifteen pounds in the potatoes and mix all together with the barley or ground oats, but not middlings. The latter is too sticky to use in boiling water. This can be fed to the turkeys as long as it lasts, and they very rarely get tired of boiled potatoes. In fact, if potatoes are plentiful on the farm, the whole course of fattening may be with this boiled mash, using barley and oats as the ground feed in turn. Any kind of vegetables that happen to be plentiful may be used, but nothing is quite as good a flesh former as potatoes. The corn lasts longer and that is why it is fed at night so that the system is absorbing some food all the time. If the feed is all mixed cold it is better if it can be mixed a part of the time with sour milk.

We know many turkeys are fed on a corn diet solely, and they are fat, too, but an all corn diet while it fattens, it does not give the meat any flavor and the breast meat is always dry. .The ground oats and barley make juicy meat as well as fat meat. Feed all the green feed the turkeys will eat, at least once a day, and twice is better. If there are no cracklings to be had, either beef scrap or tallow must be used the last two weeks of fattening. Unless milk is plentiful, in which case the meat can be omitted, but tallow during the last week, at the rate of a tablespoonful to each turkey once a day should be given. A great deal depends on the grease, though it matters very little what kind it is so that it is wholesome. Turkeys fed on this plan will always insure a high price, and most farms have small potatoes that are fit for nothing but feeding.

In shipping to market, always put birds of one size in a coop, as near as possible, it often gets you a better price, besides it is direct information to the commission man that you are not a novice in the shipping business, and he pays more attention to the shipment. Put the address of the party the shipment is made to in plain view, also a return address of your own, so that your coop will come back. This is part of the deal and all shippers should insist on their crates being returned. The farmer needs to be business-like in his dealings with others, and demand his rights.

CHAPTER XXXVIII

RAISING GEESE PROFITABLE

The goose is one of the very earliest birds known to have been domesticated. It is, in fact, so long ago that it is not definitely known how long, but certainly a long time. Mr. Weir says "It is possible that the ancient Britons may have kept geese for amusement and not for food." Maybe, but I don't believe it; the goose is England's national bird, just as the turkey is the national bird of America. No Christmas dinner is complete in England without a goose and very few Englishmen will keep anything for amusement that he likes to eat. And I know many other people of all nationalities that like geese, too.

There is not very much of a market for them in Southern California, but San Francisco is a good market for both live and dressed geese; and as our population takes on a more cosmopolitan character, which it certainly will do after the opening of the Panama Canal, the market here will be better.

Geese are long lived, so that it pays to get good ones in the first place and then keep them as breeders. William Rankin, a veteran goose breeder in the East, cites one instance of a goose owned in Boxford, Massachusetts, which was the property of one family for 101 years, and was then killed by the kick of a horse. She had laid fifteen eggs and was sitting on them when a stray horse approached too near the nest. She rushed off to defend her eggs seized the horse by the tail, and was killed by a kick from him.

Some breeders claim that geese seldom get too old to be good breeders, while there are others who prefer their breeders to be from two to five years old. But where I came from in England, those who raised them kept breeders twenty-five to thirty years old. Sometimes, though, it happens that ganders will show favoritism and if they do this when young they will get worse as age increases so that most all the eggs will be infertile. So it is better to change the male and retain the females.

These cases are cited just to give an idea or two to guide anyone who wants to breed and raise geese. Personally, I am a lover of geese and had intended to keep a small flock here, but found that they stripped my young trees of their leaves. When the trees get larger so as to be out of their reach I will get a few more. They are easily

managed and can stand pretty close confinement if necessary, but, of course, like all other birds, do better with plenty of room.

I have kept geese in England, in Dakota, in Sonoma County, California, and two years ago got me a trio here. And in all these places the geese were the same, always ready to do their part, always gentle and easily kept in bounds, better than the best watch dogs that were ever invented, and when given range on grass the least expense and least trouble of anything I ever kept.

The man who has a piece of low grass land that can be fenced in —a very low fence will serve geese—can not put it to better or more profitable use than investing in a few good breeding geese. And right here in California we have the best climate in the world for raising early geese. And it is the early goslings that pay. If you want to turn grass into greenbacks, raise geese. But if you have a small orchard of young trees and no grass, for the sake of your own temper and the trees, don't raise geese.

Varieties.—While you are about it get the best—there is no money in scrub geese. The Toulouse geese of French origin, are green in color, with a white belly and a streak of white around the bill. It is a good layer and easily fattened, but there are very few pure bred geese of this variety to be found from the fact that it has been crossed so much on the common grey goose.

The Embden goose is the leading variety in this country; it is among geese what the Pekin duck is among ducks—one of, if not the very best of all varieties. Pure white in color of feather and meat both, a pair of young ones well fed will weigh as high as forty pounds. While they do not lay quite as many eggs as the Toulouse, the feathers bring more money, so that makes up the difference.

The African geese are as large as most of the Embden and Toulouse, and it is claimed for them that they are more prolific than either. The ganders are active and sure breeders and mate promptly with any variety of geese. This latter quality is certainly in their favor, as not all geese will do that. They can also be mated with five times as many geese as the Toulouse and twice as many as the Embden. The drawbacks to this variety are: First, it is hard to pick; second, its skin and bill are dark colored. Just so long as our people buy to please the eye rather than to nourish the body, these small things count in the price of an article and so many good varieties of both geese and other fowls are held back by this prejudice.

The veteran goose breeder referred to before, William Rankin, says: "I think the most perfect goose is the pure bred African, as they lay more eggs, mature earlier and make more pounds of flesh in the same time. They are very vigorous and hardy, and you will nearly always raise all you can hatch." He ought to know what he

is talking about and I know of one California breeder who raises the African geese to perfection.

The Brown China geese are also a valuable addition to the list of varieties, but are not very well known on this Coast.

Mating and Caring for the Breeders.—Whatever variety your fancy may choose, you can learn from the breeder of it how many females to put to one male, for breeds differ in this respect. The male should be longer in leg than the female, as length of leg gives him activity; he should not be burdened with an abundance of fat, yet be in fair flesh; his eye should be clear and bright and if he easily takes to the warpath, as indicated by his stretching his neck and hissing at objects or people, you may know he will make a good breeder.

If there is no water, that is, running water, there must be a trough or artificial pond of some sort—some contrivance for them to get in to mate. Dig a hole in the ground and build in a shallow cement basin, say 2x3 feet for a small flock. This basin or pond must have a pipe hole in for a ½-inch pipe at least; the pipe need not be very long, just so that it carries the dirty water away. When water is needed in the basin a plug or cork can be inserted in the pipe hole. If the water is only a foot deep it will answer the purpose, but two feet would be better.

Near the water should be built the shed in which the geese are expected to lay, sleep and hatch their young. Almost anything in the form of a shelter is good enough, so that the nest is in the dry for winter, and a little shade from the sun for summer. The quieter a place for nesting, the better the goose will like it, and if the rays of the sun strike it a part of the day it will be kept sweeter.

Feed.—The laying geese do better on grain such as barley, oats and wheat. Corn to too heating and fattening. If the weather is cold, give a mash of ground oats, bran and rolled barley. Boil cabbage, beets, turnips, or potatoes and mash, then mix in the ground grain. When cool, feed to the geese in reasonable proportion to the number but do not get them too fat.

Some take the first eggs away, but this hinders the goose from sitting and causes her to keep on laying. So if early goslings are desired, it is best to leave the eggs and furnish the goose with some loose straw for her to cover up her nest when she leaves it.

Hatching.—Sometimes hens of the large breeds, such as Orpingtons, Langshans, Rocks and Cochins, are used to hatch goose eggs, but they must be in good condition or they cannot stand the strain.

It takes thirty days to hatch goslings and then sometimes the little fellows are slow. I have seen it take thirty-two days. But it is best not to hurry matters, except that a little hot water may be

poured around the nest to create a steam. Be careful that it does not touch the eggs or the goose.

When allowed to sit her own eggs out the goose will usually lay from twelve to fifteen eggs, though there are cases where a goose lays twenty and over before sitting, but these are exceptions. A goose is generally good for one hundred eggs in a season, but they won't all be laid in time enough to hatch. However, they are good to use in cooking and one will go as far as six hen eggs in making cake, crullers, etc.

If goose eggs are to be hatched by hens, see that the hen is well supplied with good, nourishing food during her incubation and kept strictly free from lice. Treat the eggs as recommended for duck eggs hatched by hens, that is, sprinkle at least two or three times a week during the second and third week and every day during the last week with warm water. Do this just before the hen returns to the nest. The goose carries the water in her feathers to the nest.

Feeding and Caring for the Goslings.—The treatment of ducks is very applicable to goslings. Warmth is the first requisite; soft food and warm water to drink for the first few days. A little bread soaked in milk or some cracker crumbs make a good feed for the first few days, but very little is eaten by them at all for three days. After they begin to eat well, make a mash of one part stale bread soaked in warm water, one part middlings, one part alfalfa meal and two parts bran with five per cent beef scraps, a little coarse sand and a pinch of salt. As they grow older, add corn meal and increase the beef scrap until you are feeding twenty per cent of beef scrap and two parts corn meal. If baker's bread can be bought cheap, that may form a big share of the mash. Do not let the goslings get in water if you want to sell as green geese; it hinders them from putting on flesh. Give them water to drink in a dish that will reach up to the eyes and always fill it at feeding time. That is all the water they need for health.

A little clean straw for a bed is about all they need at night if the mother goose is with them, but if they are being raised by hand, it is better to give them a good warm box and see that it has a wire front to protect them from cats and other enemies. Also, and this is the most important item in the rearing of goslings and it will pay those who are interested to read and heed what is here said. Be sure you provide a shelter from the sun, for hot sunshine kills young goslings.

Few Ailments.—Except cramps on account of being given cold water or allowed to swim in it, I do not know of any ailments that attack goslings. They have no lice, no roup, no canker, nothing but just good wholesome health and if you will let them, they will attach themselves to you or any member of your family like a pet dog and

guard you and your home from invasion by an enemy. The wonder to me is that everybody with a little spare land does not keep a few geese. They will furnish the family with the choicest meat it is possible to get at the lowest cost and the feathers will sell for from twelve to fifteen cents a pound for colored and twenty-five to thirty cents for white feathers.

Old geese have a disease called "rattles" that is akin to roup in chickens. Give a little physic like salts in the mash and keep clean.

CHAPTER XXXIX

PIGEONS FOR PROFIT AND PLEASURE

The man without a hobby is almost as miserable a being as a woman without a fad. The fact is both of them lack the interest in something outside themselves to keep the fires of youth burning. If you want to live and enjoy the pleasure of living have a fad or a hobby and ride them till you get tired, then change for another. My fad has been chickens for a good many years, but now I am in that stage where I am on the fence because I have taken up with pigeons, too. And to the beginner in pigeons I would say that the very best way to start is to go slow. Begin with a few pairs and learn their ways and needs before venturing in too deep. The pigeon fancier must have the same patience and perseverance that a good chicken man or a gardener has when he plants seeds in the ground. He knows he has planted the seed, but there are perhaps a dozen enemies to attack his plants, so that he never knows what he will get until it is safely harvested. The pigeon fancier must await the mating, unless he buys mated pairs, the production of eggs, the incubation, the growth of the squab in the nest and the feathering into full beauty before he can reap any reward. But it all comes so natural and each stage follows the other in such orderly growth that the interest is carried along to the finish. For boys I cannot conceive a more interesting, and if conducted on business principles, a more profitable pastime.

Years ago the pigeon fancier and dog racer of the old country were considered the toughs of a community, but late years I have many times wondered if the love of those birds and animals was not the saving grace that made those men and boys human, and without which they would have been toughs indeed. I don't believe it is possible for a boy who really loves birds and animals to be evil; his mind has not got the right turn.

Breeds.—But to get back to pigeons: The fancier will ask what breed is best to keep? And in that as in the keeping of most pets, there must be the personal likes to be considered as well as profit. For a person to buy what they do not like is not the way to improve it and get the best out of it. Then, again, we must know what we want them for. Is it for squabs, racers, or just something to have as a hobby? If squab raising is the object, there are several good breeds to choose from. First in numbers on this Coast, I believe,

are the Homers. They are prolific, good nurses and of medium size. If Homers are crossed on the Hen, Runt or Dragoon the progeny will be larger and bring a better price. But the Belgian Carneaux is at present holding the stage as the best squab pigeon. These birds are larger than the Homer, quite as prolific and excellent mothers and nurses. The prices on these birds are higher than the Homers, because there are not enough of them to make them cheap, nor will there be for some time, as prices in Eastern States are being held up by a scarcity.

The Loft.—Now for the loft, for after all that is the first thing to think of, even before the pigeons are bought. In California we do not need any expensive buildings for pigeons any more than for chickens. All that is required is that it must be a shelter from rain and sun, be safe from cats, rats, hawks and mice.

The cat proposition can be taken care of by putting the wire netting of the fly under ground several inches. Rats must be exterminated, for there is no safety for the pigeons while they are on the premises; mice, too, must be exterminated, for they often cause trouble by making their nests in the nest where a pair of pigeons are hatching and by disturbing them cause them to forsake their young.

One of the largest pigeon plants in California had nothing but just a roof over the nests of their breeders until the heavy rains of the winter of 1913 washed a great portion of the plant away. I think our stock ought to be better sheltered than that, but any ordinary poultry house can be converted into a pigeon loft by adding nests to the house and a good sized fly outside. Each pair of pigeons needs two nests with one lighting board.

Furnish the birds with tobacco stems and oat straw to make their nests of and a bath in the fly and that will solve the question of lice. At least it has done for us so far, as all our pigeons are clean and free from lice, mites or any kind of vermin.

Feeding.—Like all other kind of birds or animals, the better pigeons are fed, the better results can be expected. Good feed includes good sound grain, a variety of it and green feed, grit, charcoal, salt, oyster shell, etc. Red wheat is better than the white varieties. Kaffir corn or cracked corn hemp and Canada field peas make a variety that will keep pigeons healthy and in good breeding condition. Not too many peas should be served when the birds are breeding, as they are very fattening. But when there are many squabs to be fed, extra feed should be allowed for them. For a pen of fifty birds we give three quarts at a feeding, and when there are many squabs, at least a pint extra should be served. In addition to this they have lettuce, rape or kale which ever is being fed to the chickens at the time, once or twice a day. And these birds have done wonderfully well. Sometimes I think a little broken rice and millet seed

make a nice change, but that is just optional, as they do very well without it.

Care.—The feeding must be done regularly, especially during the breeding season, because if the birds have to wait over the usual time the task of feeding the young is neglected, or they are fed so irregularly that they do not grow as fast as they otherwise would. The watering, too, must be attended to and a good supply of clean water kept in a clean earthen crock for drinking and a large open pan for a bathtub. This should be changed every day, because a lot of birds make it very dirty.

At least once a week the nests and floor of the houses should be cleaned out and whenever a pair of squabs are in a nest they should be cleaned out for this is where mites will start if anywhere.

Pigeons in health show a bright, lustrous eye and bright plumage, which in sickness goes dull and lusterless, so that it is easy to tell if a bird is off its feed.

Like all other species of the feathered tribe, pigeons molt, and sometimes the molt goes hard with them, but a little extra care and watchfulness will help tide them over. A little extra hemp and a little flax seed or sunflower seed at this time will be acceptable and help in the molting and the feather building process. For a tonic give a little Douglas mixture in the water. A tablespoonful to a pint of water is about the right proportion. Directions for making will be found on another page.

Hatching.—Some authorities claim that the squabs hatch in eighteen days and others say sixteen, but unless the first egg is removed from the nest and a dummy egg put in, one squab will hatch before the other. So when the first egg is hatched it is better to remove it, mark it and mark the nest you take it from, then keep in a small box covered with a cloth in a moderately warm room. When the second egg is laid take the dummy out and replace the first egg and in eighteen days your squabs will hatch if there has been no disturbing influences around the parent birds.

In four weeks' time your squabs will be ready for table, nice, fat, plump delicacies that invalid or epicurean alike will be glad to get.

I do not know of anything in live stock that gives such good returns for the amount of labor and money expended.

Catching Pigeons.—Pigeons should never be caught by the leg. If you are not adept enough to catch them on the fly, with the hands, make a net. Anyway don't try to catch them by the leg, for you may break it.

Diseases of Pigeons.—Presumably pigeons are heir to as many diseases as chickens, but if the general health of the flock is kept up there will not be much danger from disease. Sour crop seems to be

Breeding Pen of Pekin Ducks

A Merced County Flock of a Thousand Turkeys

one trouble they are afflicted with, and if a little bicarbonate of soda is put in the water the pigeon will cleanse the crop and contents itself very quickly.

Canker.—This is similar to canker in fowls. A bit of bluestone as big as a pea in a quart of drinking water will dispose of that in a few days.

Roup or Cold In the Head.—For simple cold in the head, sneezing, etc., a dose of Epsom salts will generally be found effective. When there is roup with sneezing, the birds must be examined, and if necessary the heads dipped in peroxide of hydrogen. Give one or more dozen pellets of spongia dissolved in the drinking water. Watch for results, and if necessary dip the heads again.

Worms.—Small pieces of garlic may be put down the throat at times, or a dozen pellets of santonine dissolved in the drinking water. As pigeons do not eat meat or drink milk, I cannot conceive of them being very much troubled with worms.

Diarrhoea.—This is caused by musty food. First, change the food, thus removing the cause, then give ipecac or a little lime water made as directed in another part of this book.

Indigestion.—Give nux vomica and change the bill of fare slightly, adding some hemp seed. If sour water runs out of crop give a little bicarbonate of soda in water.

For Lice.—Dust with any good insect powder, and grease the head with olive oil and creolin.

Sore Eyes.—Cause is usually filth and overcrowding. Bathe the eye in witch hazel and peroxide. Just a few treatments will cure.

CHAPTER XL

POULTRY DISEASES AND THEIR REMEDIES

If poultry were treated in a more natural manner, they would not have very many ailments, but two-thirds of those who keep poultry do not have the least idea of how and what to feed nor what a chicken can stand. For instance, I sold a boy a little bantam hen; the day was very warm and I told him that it was not really fit to take out so far, but he insisted he could take her safely. Now, instead of going straight home, he went to some races, spent four hours watching races and left the poor little hen tied on the handle bars of his bicycle. She died a week later and then he thought I would make his loss good. But he paid for his experience as we must do if we are to build characters. If I had made that loss good it would have been no lesson to the boy at all. Now he knows that bantam hens won't stand any such treatment.

Sickness and accidents are sometimes unavoidable, but not often. Sometimes the birds of the air carry disease around, and in such cases we are helpless.

Diseases may be classified as those of the head, throat and lungs. This group of ailments includes colds, roup, canker croup, bronchitis, diphtheretic roup and pneumonia.

Colds.—In common colds where there is sneezing and running of the eyes, the remedy is a quick physic at once and find the cause. If it is caused by a draught of cold air coming through cracks, remedy it at once; if it comes from climatic changes, give physic in a little warm mash. The physic that serves the best is Epsom salts or common coal oil. Allow about half a teaspoonful for each chicken and see that it is well distributed in the dry mash before mixing with water. In case oil is given, mix the oil with the quantity of water to be used in the mash and mix well after. In the drinking water put a few pellets of spongia, about one dozen pellets dissolved in half a gallon of water will do. Spongia is the homeopathic remedy for roup (croup in children or chickens), and it is a good one; humane and quick to act if sufficient is used. The trouble is that it is high in price, hard to obtain and by the time a person gets it his chickens are often past cure. If kept on hand it will be found reliable and easy to use. For the sure enough roup, the cold that has been neglected until it has that roupy smell that one never forgets, spongia will help by giving in the water to drink, but the head, nose and eyes must be bathed in a disinfectant besides.

For this purpose Kreso dip No. 1 is very good, but almost any of the germ destroyers on the market will answer. Roup is a germ disease and when you know that, it is easy to find a cure. As a last resort dip the fowl's head in coal oil and give a bromo quinine pill. This will cure when everything else fails, but coal oil is harsh treatment and it is better to use milder remedies.

Fowls that have had roup should never be put in a breeding pen, for the offspring will have a weak spot in the same place. Dispose of them, no matter how much they are worth.

Canker.—Canker is not always caused by colds, neither is it always roup. Sometimes male birds get it by fighting through wire fences, and again I have known it to be caused by dirty, foul feeding grounds. Canker is generally described as a cheesy matter, but it is more in the nature of an ulcerative sore on the inside of the mouth. It affects the mucous membranes of the mouth, eye and throat. The surest and quickest remedy for it is to apply a bit of powdered bluestone direct to the ulcer. Take a stick and make a little paint brush with a bit of clean cotton, wet the cotton, dip it in the bluestone and swab the sores. Scrape off the old sore and apply again; about twice will cure it.

Diphtheretic Roup.—A great many people seem to think this disease is a sort of chronic roup, but the odor from it is not the same as that of roup. Both are contagious and infectious, but the diphtheretic roup is far more deadly in its action. When a fowl has an attack of it the remedy must be applied promptly, for the hen soon begins to show signs of losing strength and flesh. If only one bird is attacked it is better to kill and burn her at once, move the rest to fresh ground and give all a tonic so as to brace them up. It comes on so suddenly that I have thought the birds carried the germs in their mouths, for I have seen odd cases spring up where no sick birds had ever been kept and in all such cases where the trouble was found out and the sick fowl killed at once, the disease went as suddenly as it came.

Symptoms.—Fowl's body and legs are hot, comb is hot and of much darker, brighter red. Later as the fever decreases it gets paler. The throat is patched with white almost like a child's throat in diphtheria. Any attempt to remove these patches results in bleeding. Breath is foul and of a distinctly different type than roup smell. When you are sure it is diphtheretic roup, take the fowl in the left arm, holding it partly under the arm with the head well out and pour good strong peroxide of hydrogen down its throat until it ceases to foam. As soon as it stops foaming take the swab as mentioned in canker, dip in powdered bluestone and swab the throat out with that, or drop the dry powder on the spots; it will burn it out. Bluestone

and nitrate of silver are the quickest remedies, but unless the bird is a valuable one it is safer to kill it and cremate the body.

Pneumonia.—If hens are kept in good health and given plenty of fresh air, this disease will never trouble us in this State. Debility and closed-up houses are responsible for the condition called pneumonia. The remedy lies in your own hands; namely, open front houses and good feeding.

Diseases of the Liver.—These liver troubles are nearly all caused by wrong feeding, and the general impression is that they are caused by too much animal food in the form of beef scrap. But this is not so. Most of it is caused by too much of the carbon-hydrates or starch foods. And the worst of it is that until the fowl is dead, there is nothing sure about what disease it had. And now here is another cause of liver complaint—too much condiments, too much Douglas mixture and copperas solution in the water. Throw it out and give pure water to drink and less condiments. The liver is the most abused organ in a fowl's anatomy. Cut out some of the starchy foods, and turn them on a grass run if possible. Mix castor oil in a little mash feed, allowing a teaspoonful for every hen, then add water to mix all just crumbly. Get a small vial of homeopathic podophyllum. These can be dissolved in the drinking water a few days and with proper feeding the fowls will soon be all right.

Going Light.—This disease is often called consumption, but it is nothing of the kind. Sometimes a hen will begin moping. She stops scratching and seems to take no interest in anything; keeps going lighter and lighter, until she is nothing but a handful of feathers and bone. I have seen where a good run would change things, and that is the first remedy to try. Set some small boy after her with instructions to keep her on a run. Of course, if it is an old case this will not do any good. The trouble is caused by the oil glands getting stopped up. If the gland, found among the tail feathers, can be reopened the hen soon recovers. If it cannot get reopened, annoint the parts with some kind of animal fat; goose oil is good or mutton tallow. Give the hen a little sulphur in feed if she will eat and she has a chance to get over it, but if not attended to, she will always die.

Liver Diseases Include Congestion, Inflammation, Hypertrophy.—As stated, nearly all disease of the liver is due to wrong feeding; that is, an overfeeding of a ration too rich in starch elements. Potatoes are very little but starch; so is the baker's bread fed as table scraps. The scraps consist mainly of potatoes and bread. The liver is the most abused organ in the anatomy of a fowl because it must work overtime to make up for the mistakes made by the feeder.

In the first stages of congestion, the symptoms are very similar to those of enteritis. There is a lack of color in comb and wattles,

a watery diarrhoea, dark at first, then changing to a nasty yellow. After a while the comb turns dark red or purple color and the fowl mopes around without ambition.

If these symptoms are noticed and the fowls properly treated all will be well, for nature is quick to respond. Drop all starch foods such as corn meal, potatoes, and flour and if the fowls can be turned out to grass, let them have little else for a few days, so that the liver has time to rest. If they cannot be turned out to grass, give any kind of litter to pick over and get exercise. Nux vomica in the drinking water, ten or twenty drops to a pint, keeping away all other water, will soon effect the change. If nothing else is handy give bicarbonate of soda and bisulphate of magnesia in small doses for three or four days.

If the congestion is not stopped, inflammation soon follows. The symptoms of inflammation are heavy breathing along with the diarrhoea and a lowered vitality. The fowl gets poorer all the time and has great thirst, with an almost total loss of appetite.

Treatment.—Clean out the bowels with castor oil dropped from a spoon or dropping tube. The treatment must be individual now as the birds refuse to eat and every minute is time lost. Follow this with tincture of nux vomica, half a teaspoonful to a quart of water. As the birds are thirsty they will take the medicine that way. Keep them perfectly quiet and as soon as they will eat feed boiled rice sprinkled with cinnamon. It takes prompt treatment in these cases, for they don't last long.

Hypertrophy of the Liver.—This disease is much more common in parts where fowls are fed largely on corn and kept housed up during the long winter months. It is due to these two conditions, overfeeding of overheated food and not enough fresh air and exercise. I have never had a case and have not heard of many. If fowls get too fat it is a good idea to give a dose of physic in the mash about once a week and that will prevent a tendency to enlarged or hardened liver.

If podophyllum and nux vomica are kept on hand in a poultryman's medicine chest, he never need fear losing any case from indigestion or liver complaints. These two homeopathic remedies act silently but surely without distressing the liver at all.

Diseases of the Egg Organs. Their Cause and Cure.—The fact that there are more cases of egg-bound in late winter shows that an over-fat condition of the abdomen is the greatest cause of egg-bound in hens. It is not always too much feed that causes fat. More often it is lack of exercise and feed of too fattening a character. Active hens like Leghorns very seldom are victims of egg-bound, and from this it can be seen that the trouble is preventable.

Hens that are inclined to put on fat should be fed in deep litter and nothing of a fattening nature fed on the side. Ground bone rather than beef scrap should be the meat diet. Egg-bound hens are liable to die of heart trouble, as the straining to dispose of the egg causes great disturbance in the cardiac region.

Symptoms of Egg Bound.—The hen is restless, often going on the nest and leaving it several times, the tail feathers are droopy as if the hen were in the rain. Sometimes the hen can be helped by passing an oiled finger around the egg passage, then give a tablespoonful of olive oil to drink. Holding the hen with the vent over a bowl of hot water will cause the muscles to relax so that the egg can pass. But prevention is much surer and better. Keep hens from accumulating fat on the abdomen and there will neither be egg bound nor many soft shelled eggs.

Inflammation may occur with egg bound condition or it may be caused by too much condiments that have irritated the inner lining of the egg passages. This is a very serious disease and must be given attention or nothing will save the hen so affected. Unless the egg can be removed and the fat be reduced at once the case is almost beyond help before being noticed.

If the inflammation is caused by a broken egg or a retained egg the cause must be removed before we can hope for a change for the better. Bathe the lower part of the abdomen in warm water, give a few drops of fluid extract of ergot and after injecting olive oil manipulate gently with the fingers until the egg can be reached, then remove it. Feed very light for some time and tone the hen up with a little iron tonic.

Soft Shelled Eggs.—This is not exactly a disease but it is not a normal condition. Anything that is not normal must be abnormal, and an abnormal condition generally ends bad. Hens will sometimes drop soft shelled eggs from fright, even when not frightened, if there are strangers around, or dogs. Worms are also exciting causes of soft shelled eggs, but the most frequent cause is an overfat condition of the abdomen. This is easily cured if the fault is from overfat condition. Make the birds work for what they eat in deep litter, cut out a large portion of the starchy foods and feed more alfalfa in the mash feed to counter balance the mill feed. See that the hens are well provided with oyster shell, grit, etc., and give a heaping teaspoonful of sulphate of magnesia in a pint of drinking water, keeping it before them for one day and given twice a week. If this does not reduce the fat, turn them out on grass and feed nothing else for a week.

Peritonitis.—No one has ever known of a fowl that got better and lived with this disease. It is an inflammation of the membrane covering the organs in the abdomen. The fever runs high, from 105 to

110 degrees, and the most humane thing to be done is to kill and bury the bird at once, as a cure is impossible.

Dropsy.—This is more an indication of other diseases than a disease of itself. Anemic fowls or those in dirty quarters sometimes develop dropsy. There is a watery gathering between the tissues. The fowl has a fatty, baggy appearance, but on being picked up you find it poor and thin with this collection of water instead of fat. Tonics, such as nux vomica, a teaspoonful to a quart of water, or arsenate of iron, one grain to a quart of water, will be helpful, or homeopathic pellets of arsenicum. But the conditions must be improved, cleanliness and good nourishing food will work a cure.

Break Down.—This condition and dropsy are often mistaken one for the other, though quite different. Break down is a baggy condition of the abdomen caused by fat. Hens fed on a corn diet and allowed to get too fat will break down. It rarely happens with pullets of any breed and only hens that are inclined to lay on fat are afflicted. When hens get in that condition, there is no use wasting time trying to reduce the fat; it pays better to market them.

Vent Gleet.—When this condition arises there has been some exciting cause, such as a broken egg or egg bound will sometimes bring on the inflammation. It usually begins with redness and a swelling around the vent, followed by a white milky discharge. If the hen can be caught and removed from the yard at this stage it will confine the trouble to the one case. It always begins with a hen, unless a new male has been brought from where the trouble existed, because it is spread by copulation.

Remove the hen, and if it has gone long enough for crusts to form on the vent, the male bird too, while the rest of the hens must be carefully watched.

Treatment.—Prepare a warm bath and have a can filled with a solution of boracic acid and warm water. Inject this into the vent and wash well all around with a soft cloth or sponge. Anoint the vent with an ointment made by mixing sugar of lead and lard together. The bath and boracic acid treatment must be renewed until the birds are well. Cooling food, such as grass, roots and grain, must be fed; no meat or exciting food while the birds are under treatment. And the operator must keep his hands from his eyes or any susceptible place until they are disinfected.

Leg Weakness. Rheumatism. Cramps and Bumble Foot.—Leg weakness attacks birds that are inbred too much, but more often is the result of acquiring more fat than the legs can carry. The first thing to do is to reduce the feed, make the birds exercise more and give more bone in the diet. Bow legs are also the result of a too heavy body for the legs to support. These things only attack young

growing stock when the food is not well proportioned so that the bony structure can keep up with the flesh and muscular parts of the body. Symptoms of leg weakness are an unsteady gait, wabbling around, sometimes giving right up and lying down, where it remains an object of pity and contempt by its fellows. The bird should be removed to a shady place and fed separately a little grain and fresh ground bone. Keep it on that diet until the flesh is reduced, and if it does not get strong there is no use fussing with it. Feed it up and kill, as it will be a trouble more or less. It is noticeable that very few pullets ever show leg weakness, but generally the fast growing cockerels that outstrip the rest of the flock. Give them milk to drink along with wheat and ground bone, but no dosing.

Rheumatism.—This trouble is no respecter of sex, age or size, for it attacks all alike that are in any way susceptible. The surest symptom of rheumatism is the swelling of the joints, a contraction of the limbs and a slight rise in the temperature.

Sudden changes in climate, from a dry to a wet, will sometimes cause a sudden attack of acute rheumatism. If the bird is carried over that period it often gets better and is not troubled again. It is seldom fatal, though it has been known to reach the heart and cause death. But a bird with rheumatic tendency is of very little value and if more than one attack is had, the bird is better killed. Such fowls should never be used as breeders even if theodbgeet y g m lfssitgwild should never be used as breeders even if they do get better, for the tendency will be transmitted to the offspring.

The only internal treatment that will do any good is to add iodide of potassium to the drinking water, fifteen grains to the quart of water. But when this is given the bird must above all things be kept dry and warm, or the remedy will be worse than the disease. Give a straw bed and keep the bird dry while under treatment and it will soon recover.

Cramps.—This disease very rarely troubles older fowls or chicks raised by hens, or in fireless brooders. It is caused by overheated brooders, overcrowding, and as in leg weakness the growth of bone and muscle does not correspond, circulation is hindered and cramps occur. The remedy is in giving the chicks more room, lowering the heat and inducing the chicks to exercise by feeding the chick feed in finely cut alfalfa or straw. Medicine is of no avail in such things, but strict attention to good sanitary brooding will soon improve the chicks and cramps will disappear.

Bumble Foot.—Bumble foot is almost unknown among the small breeds. It is caused chiefly by a bruise, such as a heavy bird jumping off too high a perch onto a board floor, would sustain. Or sometimes the bird gets a sliver in the foot that causes it to gather pus.

This is where the name comes from; it is at first a slight bruise, tender and hot, the circulation is impeded and pus begins to form. The bird limps and as the disease progresses the limp is more pronounced until the bird gives up and lies around. When the pus breaks the bird gets relief, but unless the wound is looked after it gathers again and the skin on the foot gradually hardens. The foot is swollen more or less but the health of the bird not being impaired, very little notice is taken of it. If taken in time and treated as a bruise the bumble will not mature. Washing the foot in good strong vinegar and then putting the bird on a straw floor away from board floors will prevent the pus from forming. If pus does form the place should be opened with a sharp knife and the whole foot tied up in a flaxmeal poultice. The dirt must be kept out of the open wound if we are to cure the trouble.

Worms in Poultry.—There are two kinds of worms that are common to poultry—the "round worm" and the "tape worm." The round worm, as its name implies, is round, while the tape worm is flat. The round worm is much more common in poultry than the tape worm, and is not very injurious except in too large numbers. A few worms would not injure the health, but if a bird had a few hundreds eating up its food supply, that would be injurious. So to prevent the latter condition it is better to confine the worms to a limited number, or better yet, to none at all. The round worm is seldom passed through the bowels and many poultrymen do not know their birds have them until one dies and a post mortem is held. The round worm varies in size from one-third to five inches long. The head is pointed like a sharpened pencil and its color is white.

When birds have very many worms they show it by the comb and wattles being pale, the birds lose flesh and are thin, and often there is diarrhoea.

The remedy for worms is santonine. Dissolve two grains for each bird in warm water. This water to be used in mixing a mash that has been previously prepared by mixing into it half a teaspoonful of castor oil. Give this mash to the birds, seeing that all have a share, and then watch for results. All the droppings should be burned. Another remedy is turpentine and coal oil, mixed into a portion of mash food, allowing half a teaspoonful of each to the bird. The prevention of worms is much easier than the cure. It lies in feeding a little wood ashes in the mash feed with a dose of Epsom salts about twice a month except when birds are having much milk or meat, when it should be given once a week, or a feed of garlic.

The Tape Worm.—Small brooder chicks that eat mice are supposed to get these pests more than any other chickens, as the tape worm in chickens is similar to that found in cats. Raw meat of any kind will cause tape worms in young or old fowls, but very few people

give much attention to such things. Pumpkin seeds and garlic are both excellent for tape worm, and in fact are good for both kinds. Make the birds fast for twenty-four hours if you suspect tape worm, then give a big feed of garlic cut in pieces and as many pumpkin seeds as they will eat. If garlic were fed once a week to all kinds of poultry the health would be improved and no worms would ever get a footing.

Diseases of the Crop and Digestive Tract

The crop or sack through which is passed the food the chicken eats is not very sensitive, but at times it gets packed from eating food that contains too much fibre, and sometimes from too much mash food that sticks. Again, when the digestion is not carried on as it should be, the contents of the crop sours and we have a state of fermentation set in that is carried all along the intestinal tract, if not remedied. Many cases of diarrhoea start from crop fermentation. And yet if taken in time nothing is easier to cure. If the crop impaction occurs through too much coarse fibre, there is danger of the gizzard being affected, and in that case sometimes an operation is the best way out. This is not a very difficult job, but unless the operator has a steady hand he may be so long doing it that the bird will lose strength. The first remedy in such cases is to get a little olive oil or castor oil down the bird's throat in a little warm water, then commence to manipulate the crop. Hold the bird's head down and work gently, squeezing and pinching the food towards the mouth. If the food is too thick to be moved, insert a rubber tube and pour warm water into the crop gently, then work again until you give relief. Wash out the crop with a solution of baking soda and water, as this will prevent fermentation.

The Operation.—If the crop is in too extended a condition from swollen grain to manipulate there is nothing to do but operate. It will take two persons to work, one to hold the bird and the other to use the knife. Pluck the feathers from the crop and make a clean cut, lengthwise, of about two inches of skin first. Wait until the blood stops running from the first cut before cutting the crop proper. Then cut about one-half inch long into the crop and commence pulling the food and other stuff out by degrees. Put the finger in to feel if there is any obstruction, then if all is clear wash out with a little warm water and salt, sew up the crop and keep the bird quiet for a few days and feed a little soft feed.

Inflammation of the Crop.—This is caused by an irritation of some substance such as paint skins, salted meats, pieces of unslacked lime that set up quick heat in the crop. Old paint cans should never be left lying around. Old sausage meat that has been put up in brine is

an irritant that quickly sets up inflammation of the crop and kills too if it is not remedied at once. Mucilaginous drinks like flax seed tea, milk and oil or almost anything that is soothing, poured down the bird's throat will relieve and cure, but it must be done promptly.

If lime is the cause, give vinegar and water, following with flax-seed tea.

Indigestion.—This is more often the result of a lack of exercise than anything else. A change in the feed and making the fowls exercise for what they get, will often set them right. Take away all mash for a few days and give the fowls a few drops of nux vomica in the drinking water for three days, then change off and give one-eighth of a grain of strychnine to every quart of water for three days. This will as a rule put the birds in good form, but you must keep them occupied, for laziness is the mother of indigestion.

Gastritis.—This disease is generally twin sister to indigestion and inflammation of the crop. It is an enlargement of the food passage and results from irritation.

The symptoms are the same as indigestion, lack of appetite, diarrhoea one day and constipated the next. Bird strains and passes little or nothing. A little boiled rice or wheat to which is added a small amount of olive oil will be found to be the best feed for a few days. Add one-tenth grain of arsenate of copper to every pint of drinking water, and keep the bird quiet.

Diarrhoea.—Simple diarrhoea is an inflammation of the digestive organs causing a looseness of the bowels. The discharges vary in color, sometimes being whitish, and this is usually designated "white diarrhoea." At other times the discharge is greenish or yellow, the color varying according to the cause of the disturbance. The causes are too much meat in the diet, climatic changes, cold wet floors for the hens to stand on, foul drinking water, overdoses of mustard, pepper and condition powders of any kind, overcrowding and vermin. Some one or other of these things are at the bottom of all cases of diarrhoea, and sometimes too much bran and other food of a laxative nature.

The treatment consists in removing the cause, cleaning up in general and changing the ration gradually. Violent remedies rarely do any good. Keep plenty of charcoal where the fowls can have access to it. Feed sparingly and put in the drinking water a few homeopathic pellets of ipecac, about a dozen pellets to a quart of water. If the cause can be traced to bad food, such as moldy grain or smut, give arsenicum pellets.

If it is white diarrhoea, give two or more dozen pellets of aconite in the drinking water for the first three days, then wash out the drinking vessel and scald, after which give arsenicum pellets. These

homeopathic medicines work gradually and act sure. Don't think because they are not violent that they are inactive, for the finer a drug is, the surer is its action.

For old obstinate cases give a good dose, a tablespoonful, of olive oil and follow with Carbo Veg. pellets in the water.

Enteritis.—This disease is very common among poultry that are kept in yards where they have no shade in hot weather or when they are allowed to eat putrid unwholesome meat. It is often mistaken for cholera, something we do not have in this State. The affected fowls are dumpy and inactive; the comb, pale at first, later becomes dark almost purple. There is a dark colored or greenish diarrhoea, copious, and sometimes with blood in it. Fowl's crop may be full of food or nearly empty and it may keep up its appetite all through. If any die and the body is held head down, a dirty, ill-smelling liquid will run from its mouth. If examined after death, the liver will be found to be enlarged, if the case is a new one, but as the disease progresses the liver shrinks. The intestines are full of mucus and very much inflamed.

This is a contagious disease, and the first thing must be to clean up. Whitewash all coops, spray all runs with a good disinfectant and burn all refuse. Isolate all sick birds and tone up the flock so that they may be able to resist the disease. Provide good shelter from the sun and plenty of pure water. Mix plenty of charcoal in the mash and feed in a crumbly condition instead of dry, and let there be more of middlings or shorts and less bran in the mash. Drop two dozen pellets of Carbo Veg. in the drinking water and keep it up until assured that your birds are cured.

Limber Neck.—This disease is caused by eating foul, rotten carcasses and being exposed to the sun.

Symptoms.—Bird loses control of legs and muscles of neck, head points to ground. Give olive oil and set bird in a cool shady place. Pour a little hot water over top of head and let it rest.

Eye Troubles.—Sometimes chickens' eyes and the heads will get inflamed and swollen when there is no roup.

For simple cases where there is no pus a little aconite in the water will very often allay the fever, about ten drops in a pint of drinking water, or ten to fifteen drops of tincture of euphrasia in a pint of water and allow no other drink. Bathe the head and eyes in a mild solution of creolin and water or dilute peroxide of hydrogen. If pus has formed, give the spongia tablets recommended for roup, putting enough in the drinking water to make it strong and bathe in diluted peroxide. Peroxide of hydrogen is a mild and effective antiseptic in all cases where the head, throat and eyes are in need of one.

Skin Diseases.—There are but three skin diseases that trouble chickens and in nearly all cases their presence is due to some irritant, more often dirt. Chicken pox is the most prevalent of the skin diseases. The eruption may extend all over the body, under the wings and wherever there is fluff, but is generally confined to the face and comb.

Chicken pox it known by its scabby ulcers appearing in any part of the body; a dirty sticky liquid issues from the ulcers, drying on the surface and forming a dirty looking scab. The disease differs from White Comb, in so far as the last named ulcers come to a point and chicken pox does not; it just spreads.

The fowls are thirsty from a rise in temperature. Give a little aconite in the drinking water or mix a little magnesia in the mash feed once or twice to cool the blood. A little sulphur also is good and for the sores carbolated vaseline put on warm so that it will coat itself over is about the very best external remedy. But everything must be cleaned up, all dirty litter, etc., and spray the yards with sulphuric acid spray.

Fish Skin and Scaly Leg.—Fish skin and scaly leg differ so little in appearance that it requires an expert to distinguish one from the other. And yet in one case there is insect life at work, as in scaly leg, and the other seems to be due to some functional disturbance in the health of the bird. In fish skin disease it is well to tone up the birds by a little better diet and annoint the legs with a mild ointment made by melting a little lard and stirring in a few drops of creolin.

For Scaly Leg.—Wash the legs and feet in strong soap suds, rub the legs when dry with carbolated vaseline or an ointment made by mixing coal oil, lard and sulphur in equal parts, keep the treatment up until the legs are clean.

Eczema.—While eczema is called a skin disease, it is generally a sign of overfeeding of some nitrogenous food, therefore is more of a constitutional nature, though it focuses itself on the skin. Generally on the wattles and face.

There are generally several fine points raised on the skin. These fill with a thin fluid which, when they break, run into each other; the fluid runs out and forms a scab that hardens.

Give from ten to fifteen grains of Epsom salts in a little mash, and homeopathic pellets of nitric acid in the drinking water. Anoint the sores with carbolated vaseline, and improve the diet of the fowls by feeding more vegetable food, roots, etc.

Useful Poultry Remedies

For Roup: Spongia; Hepar-Sulph and arsenicum.

For Swelled Head when no roup smell is present: Bryonia, and aconite. Other remedies: Epsom salts, peroxide of hydrogen, coal oil, etc.

For Diarrhoea: Ipecac, Carbo Veg., quicklime, charcoal, etc.

For Worms: Santonine, Epsom salts, oil of turpentine, wood ashes.

For Liver troubles: Podophyllum, Carter's little liver pills.

For Indigestion: Nux vomica, sulphate of magnesia, and olive oil.

Cathartics or physics: Castor oil, olive oil, coal oil, and Epsom salts. The last is a mineral that enters largely into the body of all living things, and it should be given at least once a month to chickens that are confined.

Flowers of sulphur, another mineral salt that is in the blood, therefore necessary if fowls are confined.

Bicarbonate of soda. This should always be given first in cases of sour crop. Sulphate of magnesia, nux vomica, muriatic acid, 3 drops.

The common salsoda of commerce is useful to cleanse feed and water vessels at all times, but especially so when any contagious disease is around. Simply dissolve in boiling water and wash the troughs and all germs will die. Carbolic acid crystals are also good for disinfecting, and in cases of wheezing colds three drops in half a pint of water and given the birds to drink will often effect a cure in a few minutes.

For Ointments: Creolin and lard, carbolated vaseline, sulphur and lard, tincture of arnica, benzoated oxide of zinc ointment.

For Rheumatism: Iodide of potassium in drinking water. For rubbing for same, camphor and witch hazel in equal parts; rub daily, or rub with Venice turpentine.

Tonics: Carbonate of iron, mandrake, ginger, pulverized gentian root, flour of sulphur and black antimony. Sulphur is either tonic, cathartic or stimulant, according to quantity used.

Two Tonics

Below will be found two good general tonics that can be given to the whole flock, once or twice a week, according as the fowls appear in health and laying. For fowls that are moping and not doing well it may be given once a day until the combs and appetite show improvement.

Flock Tonics.—Linseed meal 4½ pounds; powdered nux vomica 2 ounces; powdered gentian root, 2 ounces; powdered copperas 2 ounces; bicarbonate of soda 2 ounces; powdered ginger 2 ounces; table salt 4 ounces; powdered mandrake 1 ounce. If the fowls are doing well give one teaspoonful to every quart of mash once a week; if not doing well, every day until there is change, when all drugs should be discontinued.

Douglas Mixture.—The Douglas mixture is not so popular as it was years ago, but it is a cheap tonic that many people think is all right. As it is astringent as well as tonic, it should be given sparingly for some troubles. This is an improvement on the old recipe for Douglas mixture and will give better satisfaction:

Sulphate of iron, quarter pound; aromatic sulphuric acid, 4 ounces; and one gallon of water. The aromatic solution is made in alcohol, with tincture of ginger and spirits of cinnamon added, and is much better for internal use.

To make: Place the sulphate of iron and the acid in a strong earthenware pot; pour on the water and stir well with a stick. Cover the mixture with a woollen cloth and leave for a day. Then run off into glass bottles or stone jug and cork tight.

Dose: A teaspoonful to each half pint of water or the same amount mixed in mash, every third or fourth day. The drinking vessels must not be tin or iron; nothing except earthenware or wood.

Used and made right this improved tonic is a great addition to the list of cheap poultry tonics. Like all cheap things, it was used indiscriminately and got in bad repute..

CHAPTER XLI

PARASITES AFFECTING POULTRY AND METHODS OF EXTERMINATION

While we are exempt from some of the various troubles of poultrymen in other States, we have an extra share of lice troubles, for these pests flourish winter and summer in our mild climate, and if we keep the birds free it must be one continual fight, not to get rid of them but to prevent them getting a footing. Prevention is easier than cure, even with lice.

Lice.—The true chicken louse is a six-legged large variety; they do not suck the blood of chickens but live on the skin and feathers, going to the vent to drink. When the numbers get so large that they annoy the hen the poultryman begins to take notice, because the egg supply is less, but if he would attend to it in time these pests can be eliminated and kept down.

For laying hens and young stock before laying, the following ointment will be found efficacious, and as one treatment will last at least three months there is no reason for paying feed bills to support millions of lice.

Get one pound, or half a pound, according to size of flock, of mercurial ointment, U. S. strength. Mix with this twice its bulk of good tallow; mutton tallow is best. It must be mixed thoroughly or it will not be good. Now take a small piece about as large as a bean and, holding the chicken in the left hand with head under the operator's arm, rub the ointment well into the skin just below the vent. Rub in the skin well; the lice must go through that place to get a drink from the vent; the ointment should cover a spot as large as a fifty-cent piece and be well rubbed into the skin.

But this is not safe to apply to breeders, now mind what is said on this subject; the mercurial ointment is harmless to the stock that are used for commercial purposes, but ruinous to breeding stock.

Why this is so I do not know, but I do know, because I have experimented with it that the eggs do not hatch well; in fact, they are over 50 per cent infertile. The mercury was the cause of this condition in two pens tried out at different times. So for breeding stock we must resort to a good powder to keep the hens free, and if we would get good results we must keep them free from lice. They worry and annoy the hens night and day so that life is made miserable, and when hens are miserable they do not lay many eggs.

The following is a home made lice powder:

Four and one-half pounds of plaster of paris.
One quart of gasoline.
Half pint commercial Cresol.
One pound flax seed meal.

Mix the gasoline and cresol together, put in some vessel large enough to hold the whole, then mix in all the plaster of paris the liquid will absorb. Spread on boards or sheets of paper to dry; when dry mix in the flax seed meal and store away in cans. The object of the flax meal is to act as retainer to the other ingredients. It holds the powder in the feathers and makes the powder last so much longer. This powder can be used safely on chicks of all ages and on breeding stock too.

In dusting a fowl a great deal depends on the way it is done. If imperfectly done, the lice will not be all destroyed and will commence to breed again as soon as the first effects of the powder are gone. Work the dust into the feathers thoroughly, then again in one week from the time of the first treatment go over the fowl again and they will be safe for a good long time. The flax meal holds the powder in the feathers and lice cannot get started.

Mites.—There is but one kind of mite; they look different to most people, some being greyish in color and others red. The fact is they are all red when they have been making a meal of poultry and grey when they are starved out. They are oval in shape and have eight legs. And by the destruction they cause one could almost say they had eight mouths with which to suck. These are real blood-sucking pests and soon rob a flock of hens of their ambition and health. If the blood is the life, these pests sure go after the life of the hens, and if let alone, will drain them dry.

They breed under perches in filthy floors, cracks and knot holes in wood and wherever dirty, damp conditions are found around the poultry house or yard.

To get rid of them it is necessary to clean up all old dirty places, boxes, nests and wherever chicken droppings are to be found. For small places where only a few fowls are kept, there is nothing cheaper nor better than a can of Kreso Dip No. 1, obtained at any feed or drug store, directions on can.

Kerosene Emulsion is also a good spray for poultry houses, and if used about three days in succession no mites will be left to tell the story. Shave one bar of brown laundry soap and put in a boiler with one gallon of water. When soap is dissolved take from fire and pour in gradually two gallons of kerosene, stirring all the while. When about half cold, add one pint of crude carbolic acid and continue the stirring until cold. It should be about as thick as cream and be well

emulsified. This will make fifteen gallons of liquid lice killer that will work easily through a fine spray and get in cracks that you could not possibly reach with a brush.

Fleas.—Whatever kills mites will kill fleas, but some things will kill fleas that will not kill mites. The salt spray is a good flea remedy but not very effective for mites.

Mix one gallon of salt with four gallons of water and spray the ground where the fleas are thickest, do this a few times and the fleas will all be dead.

Ticks.—In the southern and central parts of the State, ticks have become quite a pest and many inquiries come concerning the getting rid of them. Dust is not to be depended upon, though it would be better than nothing. Ticks are of the same character as mites, that is, they are blood suckers, and being so much larger than mites, it does not take so many of them and they very soon kill a small flock of hens. Therefore, when it is suspected that ticks are on the premises, lose no time in getting after them.

The kerosene emulsion can be used as a spray, but something stronger would be quicker. Also, if weather is good, it will pay to dip the fowls and get rid of those on the bodies. Ticks always bury their head in the body they attack, so in looking for them you may mistake them for a burr or something. There is both a dark colored tick and a light one, but they are quite large, flat bodies when empty and round when full. As with fleas, a good cleaning up is the first thing to do, and it may be necessary to take the building down, for they have a trick of hiding in cracks under boards and in all kinds of places you would not think of.

Make a dip of Kreso No. 1 and dip the hens in it, putting them out to dry in the sun. Or Creolin and warm water, 1 tablespoonful of Creolin to a quart of water, neither of these things are harmful to the chickens or the feathers.

Spray the building with the following: Crude petroleum, 4 quarts; crude carbolic acid, 1 pint; crude creosote, half a pint; carbon bisulphide, half a pint. Use one quart of the liquid to one gallon of warm water and spray the houses and ground around them.

Cresol Disinfectant.—Where the plant is a large one, and the cost of materials mounts up, it will be found cheaper to make the following which was sent out by the State Poultry Farm at Davis:

Three and one-half quarts of raw linseed oil; one pound, six ounces Babbitt's lye or potash; one-half pint of water; eight and one-half quarts commercial cresol.

Take a clean five-gallon crock and pour into it the three and one-half quarts of raw oil. Dissolve the lye or potash in the half-pint of water, allowing it to stand several hours to get cold. When cold,

pour it very gently into the crock of linseed oil, stirring it constantly all the time. Keep stirring for from 20 to 30 minutes until a smooth, thick soft soap is formed. Then stir in the commercial cresol, which will dilute the soapy mixture into a clear, reddish brown liquid. This is a very powerful disinfectant and only three per cent of it is needed to destroy all insect life. This makes a cheap, good disinfectant that one can afford to use in quantity. No tick, flea, mite, or louse that this gets near will ever live to tell the story. It can be diluted and used to spray hogs and cattle in the spring time, when they get vermin on them.

The Sulphuric Acid Spray.—This disinfectant is more as a cleanser of ground than for vermin, wherever there are sick poultry, roup, diarrhoea, or any contageous or infectious disease, the sulphuric acid spray will be found useful. Materials: Sulphuric acid (50 per cent sol.) 16 ounces; water, 6 gallons.

Directions: Have the water in a barrel or large wooden pail. Add the diluted sulphuric acid slowly, being careful not to splash any on the flesh or clothing, as it burns either one. It is best to mix just what you intend to use at once, and put on an old suit of clothes to work in. Woollen will not burn so readily as cotton goods. Carefully made and used, there is no better disinfectant, but it must be used carefully and children kept away from it altogether.

Whitewash For Spraying.—Pour boiling water over sufficient quicklime to serve your purpose, cover over and let stand one hour, add salt at the rate of one cupful to the gallon and to each gallon one ounce of crude creosote. Strain through a burlap if wanted for spray pump. If a little tallow is added to the lime wash, it will not peel off so readily and will stand the rain better.

Creolin Spray For Brooder Houses, Brooders, Etc.—Creolin solution may be made any strength to suit the purpose it is wanted for, and it is absolutely safe. It is far the best to use where small chicks are to be housed.

Always get "Pearson" Creolin, eight ounces to six quarts of water makes a very strong solution that will kill any insect or vermin it comes in contact with, and yet to chicks or persons is practically non-poisonous. It can be painted on woodwork, or on floors of brooder houses or sprayed. When dry it is colorless, and there is nothing to be seen, yet as a germ destroyer it cannot be excelled. Can be used to spray brooder, incubator or anywhere about the house, barn or poultry buildings.

A Good Roost Paint.—By painting the roosts, walls, etc., of poultry houses with this liquid louse killer, lice will never get a footing in the building. The fumes from it are too strong to suit mites or other insects. One gallon crude oil, one pint crude carbolic acid,

one-quarter pound carbon bisulphide, one gill pine tar. Don't mix until ready to use, as the carbon loses strength. Paint the roosts and any other parts desired, then shut up the house for several hours. Do this in the morning; in the afternoon, open up and air the building well before admitting the chickens. They will not like going in at all, but if the building has been properly aired, it will not hurt them.

A Good Commercial Disinfectant.—Zenoleum has proven a very good disinfectant and lice killer, and it can be bought at any feed store if you do not want to mix your own. For fleas on small chickens, use equal parts of creolin and olive oil or melted lard, and half the quantity of coal oil. Apply very gently to head and neck, as that is where the fleas congregate.

CHAPTER XLII

SECRETS OF THE SHOW BIRDS' TOILET

Perfect condition plays an important part in the securing of prizes. A judge goes by the condition and appearance of the birds at the time he passes on them. Condition, in a show bird, holds the same relation as the "height of bloom" does in a flower; i. e., at a certain period the bud will unfold its petals and gradually burst into flower. It is then in its best condition—after which it will wilt. And it is so with a show bird, when in bloom, his feathers will be lustrous and plentiful, his head bright red in color, and the bird, at that time, will be in its most handsome dress.

But the "bloom" of a show bird implies more than just the feathers. It implies that the bird is in good physical condition; second, ripeness; third, proper domestication. Then we say the bird is "fit." If it is a good specimen of the breed it represents, it stands a chance to win. Ripeness means that the feathers have arrived at the stage where they have acquired the proper length and fullness, without the loss of brilliancy and pureness of color. If the feathers have not arrived at proper length and fullness, the bird lacks in symmetry. The arch of the neck, the curve of the back and the depth of saddle are all dependent of the proper length of the feathers. Yes, even the shape of breast, carriage of the bird depends on the ripeness of the feathers.

Training.—For young birds that have not been confined, the preliminary training must be to teach them to stand confinement, and get used to being in a coop. This should be done gradually, at first, say keep them in two or three hours, then let them out. Next time keep them in a little longer, and finally keep them in all day, then one or two days. Let them get acquainted with strangers as a great deal of your success at the poultry shows depends on this. If your birds are frightened and run back in the coop, very few will stop to look at them, because there are more nice birds that are not so shy. A well trained bird will pay very little attention to the noise and hubbub around him, but will take it as a matter of fact.

Training Via The "Stomach Route."—When the birds have got accustomed to the coop, it is then time to attract them to the front. This can best be done by feeding them some appetizing food, such as meat, fruit or something they are fond of. In a short time they will eat from your hand. Don't hurry matters by trying to make them do too much. When you have got so far during the day time, take out

a lantern and draw them to the front of the coop by lamp light. After they get used to being called to the front of the coop and get reconciled to their surroundings, take a light stick and pass it along the back, as if smoothing the feathers. At first they will jump back, but perseverance on your part will win out.

When they get so they don't mind the stick any more, put your hand in the coop and stroke them with one or two fingers. Then pass the hand around and stroke under the throat. Nearly all birds can be tamed thus, they give in when you get around the throat. Occasionally take a hen under your arms and go in front of the coop where a male bird is being trained. He will then be looking for the hen and will learn to expect either food or hen and be on good behavior.

The Show Bird's Diet.—Always feed a variety of feed and often, never giving too much of anything at once. I prefer good grain to mashes, though a little moist mash once in awhile is good as an appetizer. But grain makes firm flesh without fat, and a fat bird is not, nor never can be called in good condition. A little, very little, raw meat or fresh ground bone will help keep the appetite on edge, but too much makes soft, beefy combs.

The Show Bird's Washing Preparations.—Use only soft water in the washing of white birds and never use laundry soap. The genuine French castile soap is the best all around soap for toilet purposes for poultry.

Dissolve one and one-half bar of castile soap, two teaspoonfuls of oxalic acid, two teaspoonfuls of pulverized chloride of lime, two and one-half ounces of powdered borax and one ounce of ammonia in two quarts of boiling water. Keep air tight and use as a washing solution. Put enough in the first tub to bring out the dirt, then a less amount in the second tub and none in the third.

After the birds have been thoroughly rinsed in two tubs of clean water, prepare the blueing water. It is almost impossible to tell anyone just the amount of bluing to use, because the blue varies in strength so much, but the water should be about the same as one would make it for fine white clothes. It is best to experiment first with one or two birds that are not going to be exhibited, the bath will do them good anyway.

The Method Of Washing The Birds.—You will need three or four tubs to make a success of washing the birds, four is better than three. By having plenty of tubs you can have the water all fixed beforehand and go straight on with the operation. After experimenting with the blueing, and having gotten the right shade, if the water is not perfectly soft, put in a tablespoonful of powdered borax to prevent the bluing from clouding.

Put enough of the soap solution in the first tub to make a good lather; take your bird by the legs with the left hand and set it down in the tub. Let go of the feet and gently force the bird under water, except the head. Hold it by one wing while you souse and paddle around it with water with the other hand until the feathers are thoroughly saturated. Then take a small hand scrub brush and scrub along with the feathers. Beginning with the head and neck, pass along the breast, abdomen and legs, then come back and go over the neck and back route; taking the tail and all around the back portion, always working with the feathers; then return to the wings, scrubbing each in turn under and over so as to get all the dirt. When the bird has been scrubbed all over, take a wash cloth or sponge and wash out all the soap and dirt that will come.

Then put the bird in tub No. 2, with the water just about one degree cooler than tub No. 1. Go over the bird in this tub more to wash out the dirt that was loosened in the other, and to get out the soap; when the bird looks clean, squeeze the water out of the feathers as before and pass him along to tub No. 3, in which the soap must be gotten out thoroughly. Souse the bird up and down to get the clean water through the feathers, and if necessary, pour warm water over the back. When all the soap is out, and not before, pass the bird into tub No. 4, where the blue water is. This water should have the chill taken off but not over warm; when the feathers are well saturated with the blue water and to all appearances the bird is ready for drying, squeeze the water out of the feathers and put the bird on a table where several nice, clean cloths are ready. Wipe him off well and put him before a fire, or if a nice sunny day, out in the sunshine to dry.

Now the drying is, if anything, more important than the washing, as unless the feathers are nice and fluffy they will never make a bird look good to the judge's eye.

The drying pen illustrated is of the following dimensions; 6 feet long, 5 feet high, and 2 feet wide. It is divided in the middle into upper and lower compartments with wire netting on top of each. The wire netting that forms the floor for the top compartment is covered with double burlap that has been washed to take out any coloring that might be in it. The back, ends, and lower part of front are boarded; the four corner pieces are 2 inches square by 5 feet long. There is a roost 4 inches wide on which the fowls stand, placed 2 inches above the wire netting top of the lower compartment.

A door is shown at the lowest part of the front, through which two small coal oil stoves are inserted. This door is narrower than the opening, so as to allow fresh air for the stoves.

More Stoves Can Be Used.—One small stove is required for every two feet of space, or length. A pen 6 feet long will accommodate

8 to 10 fowls at one time. While these birds are drying, the washing of the others can proceed, and things will move pretty fast.

The washed fowls are put on the perches and the front curtains dropped to raise the temperature. If it gets too hot, pin the curtain back; if too cool, lower the curtain.

But while the drying is going on, some one should be separating the wet feathers (without removing the birds from the roost), as this makes it easier for the hot air to pass through the feathers. After the birds are partially dried, get a good-sized fan and open the door a few minutes at a time to operate the fan. This fluffs the feathers much better than if they are left entirely to the heat. Or if there are more birds to go on the roosts, take the first birds out and stand them on top of the coop, and use the fan until thoroughly dry.

When the birds are perfectly dry, take them one at a time by the legs, head down, and sift powdered corn starch into the feathers. This is merely to keep the feathers clean; dirt does not stick to corn-starch. Before judging comes off, the birds will have shaken all of it from the feathers, and no harm done.

The Straw Method of Washing Fowls.—Some fanciers clean their birds' plumage by what is known as the straw method. About four or five weeks before a show is coming off, the birds are confined in a house with a board floor, and given a deep coating of straw to wallow around in. It must be at least 18 inches deep to do any good and two feet would be better. The straw must be clean and free from rust or mold, and should be changed every few days in order to keep it bright and clean. This straw is a great help, even though the birds are washed at the finish, as it does take off a great deal of the dirt and clean the legs and feet.

Cleaning Legs And Toes.—If the bird has been through the washing process he is now ready for the manicure act. Go over the scales with a toothpick, work out all the dirt that did not get out with washing, by rubbing in a little sweet oil and a few drops of carbolic acid. When perfectly clean, polish the legs and feet with a little oil of pennyroyal. Some use glycerine and wax, but pennyroyal polishes and cleans much easier, and it does not stain white legs.

Oiling Comb, Etc.—The comb, face, and wattles of a bird can be very much improved in color by the use of a little glycerine and alcohol. Mix equal parts and gently wipe all over the face, ears, comb, and wattles. It can be done before the bird is shipped, and again just before judging commences.

Train The Bird To Pose.—An old cock bird can be made into a feathered grandstand player if you take the time. Take your bird out at night, when you want to commence training him, for at night they are more docile. If he gets excited, put him right back, then

try again another night. When you succeed in getting him to stand at night, then take him out in the day time and try him. The one spot where a bird is most susceptible is under the beak and throat. When you can "tickle him under the chin" he is all right; you can do what you want with him. Teach him to pose any way you want by putting a stick on that part you want him to lower or raise. At first he will be afraid of the stick, but he must be taught that the stick will not hurt him, and the way to do it is by holding the stick over him while you feed him tid-bits. Many a good bird loses a ribbon because he is so wild the judge does not care to fight it out with him.

Preparing Colored Birds.—All birds that are to be exhibited must have their legs and feet washed and put in fitting shape to be handled. Just as much care should be taken with the legs, feet, head and other points as if they were white. Now, having washed and manicured the legs, feet, etc., and washed and colored the face, comb, and wattles, take a good-sized silk handkerchief that is clean and dry and rub the feathers all over until they shine. Keep going along with the feathers, taking long strokes along the back, sides, wings and breast until your bird just fairly glistens with polish. Of course, he is free from lice; no decent fancier would attempt to send a lousey bird to a show. When a colored bird is prepared right he is something worth looking at, but, oh my, when his shanks and head are dirty, no matter how good he is, he does not make a good appearance; and when he goes to a show that's exactly what he is sent for, "to look good" to the judge. No judge likes to handle dirty birds. It is not reasonable.

Bleaching.—For those who believe in bleaching feathers, the method is given; every one has his or her opinion as to the value of it and each must be the judge. It can be detected by any judge by the lack of lustre in the feathers.

Wash the birds as directed, but do not use any blueing. Dry the bird well with towels. Then take peroxide of hydrogen and wash the feathers over, brushing it in with a tooth brush. Where there are any feathers showing brassiness or off color, brush more peroxide in, but be careful to keep it out of the bird's eyes and away from the skin. After working the peroxide well into the feathers, put the bird in a box with plenty of straw in the bottom, and cover him over to dry and bleach. The box should be in a moderately warm room, but not before a hot fire, as he must dry gradually. If all the sap is not out of the feathers, repeat the process again. After peroxiding, and the bird is well dried, take prepared chalk and polish carefully the outside of feathers to give them a silky gloss. Some wash the entire bird in peroxide, but that is really cruel and there is no need for it.

The above methods are all legitimate and are allowed by the Standard; other methods, which are downright faking, can be done by those who want to, but I will not be a party to it by giving information about how it is done.

CHAPTER XLIII

KILLING POULTRY

After killing leave it to bleed and get your water ready if to be scalded, but dry picked poultry is much better flavored. The water must be near the boiling point, but not quite boiling. The bird must not be dumped in wholesale, but the head must be kept entirely out, and a cloth tied around it helps to keep it clean.

Cleanliness in preparing for market is a great drawing card. People will always pay a little more for something that is clean and properly prepared.

Unless the customer asks for it to be done, it is not customary to draw poultry in this State. What is called dressed poultry is being killed and the feathers taken off, wash the body and put in ice cold water to cool off. The fowl is weighed before being drawn, and the customer pays for the gross weight.

When sold to commission men or produce men, they prefer to have them shipped alive. The fowls, to bring the best price should be about all of one size and age and be in good condition; it goes without saying that they should be perfectly healthy, because the time is gone by when diseased fowls can be sold at any price. Remember that if a crate of fowls is shipped, the shipper gets the price for the whole crate based on the condition of the poorest fowls in it; if he mixes them to pass off a few scarescrows, they are all in sight, all are handled by those who buy and no tricks can be played on these men; they are up to all of them. This is a sure enough case where "honesty is the best policy" for the shipper. If the dealer tries any tricks you can come back at him full of righteous wrath and make him come across with the goods.

Killing And Dressing Turkeys.—Turkeys are always dry picked anywhere, so all that is to be done in killing turkeys and shipping to market is to kill in a similar manner to killing chickens, only killing what there are pickers to work at one time. When a bird gets cold the feathers come hard, so just kill as needed for pickers and have them in a fairly warm room, so that the birds will not cool off too quickly. Leave a few feathers around the head, but pick clean as you go, taking the feathers the way they have lain. Be careful not to break the skin, for one break causes another, and the bird does not look attractive when covered with broken skin.

If the turks are to be shipped, cool off in cold water, but don't

leave too long or it will be difficult to get them into shape. They should be packed in barrels or clean grocery boxes, with clean paper around to keep out all dust and other things, flies, etc.

Killing And Dressing Ducks—When finishing ducks that are to be marketed either locally or shipped away, there should always be two tubs or buckets of water, one hot and the other cold. Plunge the duck into the hot water just a minute, then into the cold water; this is called plumping, and it has a decided effect on the appearance of the duck. This plumping must not be done until you are about ready to pack.

CHAPTER XLIV

WHAT LOS ANGELES POULTRYMEN HAVE ACCOMPLISHED BY CO-OPERATION

Less than three years ago the Poultry Breeders' Association of Los Angeles was content to hold an annual poultry show once a year, and a meeting once a month, which was after the manner of an old-fashioned experience meeting, except perhaps that the prayers were not on the order of gratitude, but rather a growling against the "powers that be," which in this instance were the go-betweens or middle men that eat up the profit between producer and consumer.

Jos. E. Davis, who at that time was a breeder of Whited Rocks, was also secretary of the Association, and he saw that the holding of a show and this monthly meeting was of very little benefit to the poultrymen in general. Those outside of the fancy did not have any idea that it was to their interest to be in the Association, and so held aloof. Mr. Davis saw great possibilities for all the poultrymen, if they could be brought together for their mutual benefit. He saw how such an Association could help the beginner, who is so often lost on the rocks of schemers who are always on the lookout for the unwary. He figured that reliable information and the advice of practical men would materially affect the poultry interests of the southern part of the State. With this end in view, he wrote an article stating what he believed could be done by proper co-operation.

This paper set the poultrymen to thinking and they held a meeting to discuss the project; and at this meeting the present Association was born, with only $500 as a birthright. That was a small sum to tackle the big interests with, and very few of those present realized how "big interests" will fight when they get cornered.

But the die was cast; this handful of poultry raisers had set the ball rolling into an enemy's camp that could, in a few minutes, throw $50,000 into a fund to down them. But the enemy was short on vision, too, and it took a little while for them to really consider the Association in a serious way.

The Association at once opened up a store for the sale of poultry supplies and for handling the eggs of the members. They hoped by giving a strictly fresh article to build up a good class of patronage, but the results have proven that the bulk of people are not willing to pay any more for a strictly fresh egg than for what sells in the store

as a fresh ranch egg. The cost of candling, handling and delivering in small lots ate up the profits on the local egg trade, delivery being the largest item.

At the annual meeting on December 1, 1913, one hundred and seventy-five poultrymen, and friendly interests, had invested nearly $8,000 in money, which has had to work overtime, as so much of it has had to go for equipment and development, that there was very little left to handle the $15,000 or more sales they are making monthly.

Income.—The Association, though operating on close margins, handle a great variety of articles; they buy and sell everything a poultryman produces and uses is his poultry business. They have a department that acts as a sort of clearing house for stock, here the producer takes surplus breeders to dispose of; they sell hatching eggs and baby chicks for members, they have a regular mail order business, or shipping by parcels post, and, as Mr. Davis says, they have to have efficient help and it is up to the poultrymen to keep their help busy.

What Has Been Done and What Can Be Done.—Before this Association commenced business, the local commission houses used to pay half price for pullet eggs and dirties; the Association at once began a system of close grading, which has raised both the quality and price. So far, the greatest difficulty it has had to fight, has been the short-sightedness of some of its own members, who for the sake of the present penny have sacrificed the future dime. But there always were and always will be people so afraid to trust in themselves and their own class of workers that they will give away all they have gained by hard work to somebody with just a little more confidence in himself, and we never doubt a middleman's self-confidence.

A short time ago, Mr. Davis tells me, a prominent commission man made overtures to him for his aid to help "break the market." He said if he could get hold of so many cases of eggs in one day he could break the market and begin to "store eggs," which at the ruling price paid by the Association he could not afford to do.

Of course, the help he sought was not given. It would have been a joke for a co-operative Association to join in such suicidal competition as that, when its aim was to hold the market up so that its members could live. But what can be said when an individual member, for just one cent a dozen more than Association prices, sells his eggs to this same commission man, who was only a few days before trying to "break the market," in which case the member would have been getting about five cents less.

When we consider that this Association has prospered in spite of such handicaps as this, and many others, until now they are nearing the place where they will be able to control the market themselves, it makes us wonder.

Storage of Eggs

Last year the Association made an experiment of storing 700 cases of eggs. Heretofore the price had always gone down to bedrock in summer because the commission men told the producers that "local eggs" would not store. This theory is now exploded, for it has been proven, that with care, the local eggs will store and come out perfectly good. That alone is a victory for the poultrymen of Southern California.

This year Mr. Davis outlined a plan for the storage of eggs by members, which was as follows:

With reference to the cold storage eggs, your Manager suggests, for your consideration, as follows: That members be permitted to cold store eggs through the Association on the basis of one case of eggs for each dollar paid in on stock. That the Association retain the right to determine the quality of eggs to be put in cold storage where it assumes the right to market the same. That the Association credit the member for eggs suitable for storage at the rate of candled prices on the day of arrival. That members wishing to cold store eggs be required to notify the Association in writing of the number of cases to hold for them. That the known cost of handling and storing be shared equally by the member and the Association. These charges are estimated to be—

Season storage per case	$ .50
Season candling in and out, case	.30
Season cartage, per case	.10
Season insurance, per case	.05
Season interest, per case	.10
Season cases and fillers	.15
Total cost	$1.20
Charges to be paid by each	.60

That the profits or losses be shared equally. That all eggs stored, and which the Association is obliged to sell, be in unrestricted custody of the Association. That the Association use its offices to secure loans on eggs stored on the best terms possible. That four-fifths of the amount borrowed be paid to members, and one-fifth be retained by the Association until final settlement; this to defray expenses of handling until a sale is effected.

This plan was pretty generally discussed and finally adopted, and this season the Association has stored a great number of eggs for its members that would have gone on the market for other commission houses to store and bring out against them during the winter months.

Feed.—The Association puts out a dry mash that sells under the name of Co-operative dry mash, that cannot be beat. They buy grain

when the capital is on hand to buy in quantity, otherwise there is nothing to be gained for either party.

Baby Chick Business.—This has been one of the Association specialties. The baby chicks come from the members of the Association who are able to give good strong chicks, and there has been an almost unlimited number sold. They guarantee a full count of live chicks delivered at the express office of the purchaser. That is going a little farther than most shippers will do, so they have worked up a big trade.

New Place of Business.—In order to get more room for expansion, the Association closed a five-year lease on a large three-story building and basement at 324-330 Los Angeles Street. The building has a frontage of fifty feet on Los Angeles Street and one hundred and twenty feet on Boyd Street, with a 220 feet good cement alley in the rear with good sun exposure and room for advertising.

In this new place with over 24,000 square feet of floor room they are going to grow. There will be plenty of room for all poultry supplies, for feed, a general sales room for all kinds of live poultry, baby chicks, brooders, incubators, etc., and the third floor will be given over to the market poultry. Battery coops will be installed, for fattening birds not ready for killing, and caring for shipments until sold.

Amount Subscribed to Date.—The most astounding feature of the whole thing is that with the small beginning of $500, in a little over two years, and sailing against adverse winds a greater part of the time, there is at present, August 31, 1914, the sum of $129,000 subscribed on the book and a great portion of it paid in. Membership is $10 per 100 hens for stock subscriptions, which may be paid for monthly, at the rate of one cent per hen a month for ten months.

The Association expects soon to be able to pay dividends, but at present all money is needed for expansion. "Mind Your Own Business" is the Association's motto.

The information given above is absolutely correct and comes from headquarters. There are many more interesting phases of co-operation that might be gone into, but this one instance of what has been done in such a little time, in one of the worst commission-ridden cities of California, ought to be sufficient to induce every poultryman in the whole State to join hands and work for the mutual benefit for all.

CHAPTER XLV

METHODS OF PRESERVING EGGS

While the cold storage egg is for the city dweller, there are times when the farmer who only keeps a few hens for his family needs is obliged to buy the storage egg as his hens are molting.

By having a few chicks hatched at different seasons this could be avoided, but as a rule it is not done and the farmer has to buy eggs. As a matter of fact a farmer ought not to buy anything he can produce because there are methods of preserving everything in times of abundance.

The Water Glass Method.—This is the most popular, and if you get a good article it is about as easy to do, and all things considered, as cheap and practical as any method. Sodium Silicate (water glass syrup), is a thick syrup liquid that differs somewhat in color and consistency. The best is as near white as possible and the darker looking it is the poorer are its keeping qualities.

I think druggists claim the dark variety comes from Germany; if it does it is just as well to let them keep it at home, for I lost a lot of eggs with it one year. Along in the winter they developed mold spots on them and were not fit to eat; so when buying be sure and get the white water glass.

As the strength varies some it is always better to be on the safe side and make it pretty strong. Eight quarts of water to one of water glass is about right. Boil the water then stir in the water glass and set aside to cool. The eggs are better set large end up in layers, but it takes more room than when packed sidewise, but as the yolk settles to one side, it pays to pack endwise.

After packing the eggs pour the mixture over them cold and set away in as cool a place as possible. Earthenware crocks or wooden buckets, barrels, etc., are the best containers, but I have packed in five gallon oil cans and never saw anything wrong. The fact that water glass is sold in tin cans, gave me the idea that it was all right to pack eggs in the same material and I used them whenever I was short of crocks.

The eggs must be well covered with the solution and weighted down with a board or some simple device. If intended to be boiled, pierce the large end with a fine needle. For frying, baking or any form of cooking, these eggs are just as good as the fresh article, but, it must be understood that the eggs must have been gathered and packed fresh.

The best keeping eggs are those where the males are having a vacation and the eggs themselves gathered twice a day out of strictly clean nests. Such eggs will keep under ordinary care better than eggs given the greatest care that are not gathered right.

The Lime Water Brine Method.—This once was the method used by bakers and restaurants before the storage egg became so popular. Quick lime 16 ounces, table salt 8 ounces, and boiling water one gallon. More can be made in same proportions.

To make, pour the boiling water over the lime, stirring well to keep from burning, add the salt, and stir until it quits boiling. Allow the mixture to settle, which may take a day or two, then draw off the clear solution and pour over the eggs packed in earthenware crocks. The eggs must be well covered and weighted down or the top layer will not be good.

Other Methods.—In addition to these methods, eggs for family use may be packed in salt and bran equal parts, the eggs being so packed that no two touch. After one layer is complete put one inch of bran and salt which must be fine, over the surface and commence another layer. No expense attaches to this method as most families have on hand a clean grocery box or two and some salt and bran. The point to remember is to pack just far enough apart so that the mixture touches the eggs all around. If the eggs are allowed to touch there would be no preservative between.

A little judgment must be used in all methods, for sometimes a very little thing causes a failure. And it surely is handy to have the eggs to fall back on at a time when the price is so good that we hate to use the fresh laid article to make a cake that calls for half a dozen.

Any one with a cool, dry cellar can pack away all the eggs needed for family use in this simple way. Years ago I packed eggs in Dakota in May and June and had eggs all winter while those farmers that did not go to the trouble to pack eggs went without.

INDEX

Page

Advantages of California in Poultry Raising 7
American or English Class 81, 91
Anconas 90
Asiatic Class 96
Balanced Rations, What Are They? 58, 59
  For Heavy Breeds 68, 69
Bantams, Game 101
  Booted White 102
  Brahma 102
  Cochin 102, 103
  Ornamental 102
  Rose Comb 102
Beef Scrap Feed Hopper 52
Blue Andalusians 90
Bowel Trouble in Small Chicks 32
Brahmas, The 96, 97
Broilers, Raising 53
  Rapid and Slow Plans 53, 54, 55
Brooders—Brooding Systems 40
  And Hovers 41
  Building of 44
  Fireless 45
  For Outdoors 40
  Stove Systems 40
Buckeyes 92
Buff Plymouth Rock 91
Business Methods in Crossing 82
Buttercups 95
Campines 95
Capons 83
  Best Breeds for 84
Carbo-Hydrates, What Are 78
Chicks, Raising the 30
  Simple Food Hopper for 51
Cochins, The 96
Colds and Canker 122, 123
Colony Plan 12
  Houses 12
Condition Powders 72, 73
Co-operation at Los Angeles 148
Cramps 128
Creolin Spray 139
Crevecoeurs and La Fleche 94
Digestion, Processes of 59
Diphtheretic Roup 123
Disease of Crop and Digestive Tract 130
Diseases of Liver 124
Disinfectant, Commercial 140
Don'ts in Raising Chicks 37
Double Open Front House 17
Douglas Mixture 135
Duck Culture in California 104
  Dressing for Market 106, 147
  Ducklings, Brooding 105
  Feeding 105
  Feeding 105
Egg Bound 126
Egg Tester, How to Make 50
  Foods and Condition Powders 72
Eggs, Care and Management of 23
  Feeding for 56
  For Hatching 23
  Packing for Shipment 24

Page
Preserving 152
Soft Shelled 126
English Class 98
Fattening for Market 66, 67
Feeding, Method of 21, 22, 62
Commercial Way 31
Different Breeds 60
For Eggs 56
Green Food 31
The Breeders 61
Use of Tomato Cans 50
Young Chicks 30
Fireless Brooder, How to Make 45
Fleas 138
Food Hoppers, for Chicks and Hens 51
Home Made 52
For 100 Pounds of Feed 51
For Beef Scraps 52
French Breeds 94
Game Bantams 101
Games and Orientals 101
Geese Raising Profitable 113
Caring for Goslings 116
Diseases 116
Feeding 115
Hatching 115
Mating and Caring for 115
Varieties 114
General Purpose Fowl 80, 81, 82
George Hover, The 41
Government Work for Poultry Industry 63, 64, 65
Hamburgs 94
Hatching, Eggs for 23
Health 8
Heavy Layers, Knowing the 86, 87
Hot Water Pipe System 41
How Young Chicks Look 28
How to Get More Pullets Than Cockerels 29
Incubator Cellar, How to Build 25
Care of Lamps 28
How to Run 26
Natural Hen 47
Temperature for Eggs 26
Some Don'ts 27
Inflammation of Crop 130
Intensive Poultry Farming 21
Killing Poultry 67, 146
Turkeys 146
Langshans 96
Large and Small Egg Plants 18, 19
Leghorns, White Most Popular 88
Single Comb Brown 88
Lice 136
Location 11
Los Angeles Poultry Association 148
Markets, Good 7
Mash for Heavy Breeds 69
Mediterranean Class 88
Milk in Poultry Yard 74
Minorcas 89
White 89
Mites 14, 137
Mold, that Injures Poultry 70
Remedies for 71
Molt in California 78
To Help the 79

Page
Natural Hen Incubator 47
Oats, Sprouted 31
Home Made Sprouter 48
Sprouted, for Eggs 57
Open Front Houses 14, 15, 16
Double 17
Orpingtons 99
Black 100
Buff 99
White 100
Parasites Affecting Poultry 136, 137, 138
Perfect Brooding System 41
Pigeons for Profit and Pleasure 118
Breeds 118
Care 120
Diseases 120, 121
Feeding 119
Hatching 120
Lofts 119
Plymouth Rock 91
Buff 91
Partridge 92
Silver Penciled 92
White 91
Polish, The 94
Poultry Business 9
Appliances 47
General Purpose Ranch 20
Houses 12, 14
Intensive Poultry Farming 21
Location 11
Management During Summer 76
Preparing Fowls for Market 67
When and How to Start 9
Poultry Catching Hook 49
Poultry Diseases and Remedies 122
Bumble Foot 128
Canker 123
Colds 122
Cramps 128
Diarrhoea 131
Diphtheretic Roup 123
Diseases of Egg Organs 125
Dropsy 127
Eczema 133
Egg Bound 126
Entritis 132
Eye Troubles 132
Gastritis 131
Going Light 124
Hypertrophy of Liver 124
Indigestion 131
Inflammation of Crop 130
Leg Weakness 127
Limber Neck 132
Liver Diseases 124
Peritonitis 126
Pneumonia 124
Rheumatism 128
Scaly Leg 133
Skin Diseases 133
Soft Shelled Eggs 126
Tape Worm 129
Vent Gleet 127
Worms 129
Poultry Remedies 33, 133

Page
Prepotency and Prolificacy 85
Pure Air for Chicks 39
Preserving Eggs 152
Raising the Chicks 30
Don'ts 37, 38, 39
Redcap, The 98
Rheumatism 128
Rhode Island Reds 92
Roost Paint, Good 139
Sandbox Construction 43
Shipping Eggs 24
Show Birds' Toilet 141, 142, 143, 144, 145
Small Chicks, Troubles of 32
Sanitation 32
Why Die in Shell 34
Small Plants for Eggs 18
Stimulants, Use of 65
Sulphuric Acid Spray 139
Ticks 138
Tonics 134
Trap Nests, How to Build 48
Turkeys for Market 108
Caring for Poults 110
Fattening for Market 111, 112
Killing and Dressing 146
Mating and Handling 108
Nest, Good 109
Troubles 111
Ventilation 77
White Face Black Spanish 90
White Rock 91
Whitewash for Spraying 139
Why Chicks Die in the Shell 34, 35, 36
Worms in Poultry 129
Wyandottes 92

PACIFIC RURAL PRESS

525 Market Street - - San Francisco

PUBLISHERS OF

CALIFORNIA FRUITS
And How to Grow Them

By E. J. Wickson, A. M.

600 pages, cloth bound, illustrated

Sent pospaid for $3.00 per copy

CALIFORNIA VEGETABLES
In Garden and Field

By E. J. Wickson, A. M.

300 pages, illustrated, cloth bound

Sent postpaid for $2.00 per copy

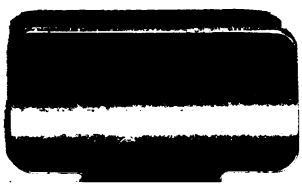
One Thousand Questions in California Agriculture Answered

By E. J. Wickson, A. M.

250 pages, cloth bound

Sent postpaid for $1.50 per copy

THE PACIFIC RURAL PRESS

Established in 1871, the Oldest Agricultural Weekly Farm Journal on the Coast. Subscription price $1.00 per year. Sample copy free

YC 20393